

FIVE HUNDRED VARIETIES
OF
HERBAGE and FODDER PLANTS



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FIVE HUNDRED VARIETIES
OF
HERBAGE AND FODDER PLANTS

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FIVE HUNDRED VARIETIES
OF
HERBAGE AND FODDER PLANTS

Edited by

M. HALL



Bulletin 39

of the

Commonwealth Bureau of Pastures and Field Crops

Aberystwyth, Great Britain.

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INTRODUCTION

It is fully expected that this attempt to bring under one cover for the first time all relevant data concerning a great number of varieties of plants used in one way or another as animal fodder will be open to criticism because of lack of uniformity in treatment, variations in standards of naming and certification of varieties, and the frequent use of synonyms. The object is to provide as much information as could be collected for this first edition and at the same time to draw attention to the general problem and to the need for action in various degrees and directions as far as recognition and naming of varieties, reduction in the number of synonyms, and other aspects are concerned. For many of the varieties listed the data are complete and the varietal names and characteristics are fully recognized and accepted; for many others the data are scanty and can be regarded as only provisional in this edition. Countries differ widely in the degree of authenticity which they require for their recognized varieties.

Many varieties from certain large countries and regions are not represented in the main part of this catalogue, but appear only in the index of references to varietal names compiled from *Herbage Abstracts*. For example, there is no direct contribution from the U.S.S.R., in spite of the attempts of our Corresponding Editor for that country to send us the necessary published works; difficulties of transmittal were too great. There exists in the Soviet Union a Government Commission for Seed Testing, which publishes annually a list of crop varieties recommended for all regional soil types, and also a statement of the yields and other qualities of varieties being tested, as compared with yields of standard varieties. It is hoped that these published lists will be available when the next edition is prepared.

Neither does this publication contain any direct contribution from the United States of America, as the staff of the Division of Forage Crops and Diseases had not the time to devote to the great amount of work which would be involved. Denmark is another obvious omission, but it is likely that this gap will be filled later.

The very helpful and valuable information made available by correspondents in many countries during the compilation of this work has been greatly appreciated, although in certain cases it has not been possible to include all the information which was provided. Grateful acknowledgement is made to all the Bureau's Official Correspondents and to the many specialists in the British Commonwealth who sent information through their own Official Correspondent, and also to the following:

Dr. O. S. Aamodt, Bureau of Plant Industry, Beltsville, Maryland, U.S.A.;

Dr. C. K. van Daalen, Soestdijkscheweg 35 Noord, Bilthoven, Netherlands;

- Director Ir. J. K. Groenewolt, Het Instituut voor Rassenonderzoek van Landbouwgewassen, Wageningen, Holland ;
- Mrs. Alli Heikinheimo, Plant Breeding Station, Tammisto, Malmi, Finland ;
- Dr. August Jäntti, Maaninka, Vainikkalo, Finland ;
- Dr. G. Julén, Sveriges Utsädesförening, Svalöf, Sweden ;
- I. S. Travin, Institute for Fodder Research, Lugovaya, Moscow Region, U.S.S.R. ;
- H. Wexelsen, Felleskjøpets Stamsaedgård, Vidarshov, Hjøllum, Norway.

It is hoped that this publication will in itself be of some interest and value to research and advisory workers, to the Seed Trade and other people concerned, and that readers will feel no hesitation in writing to criticize the content and presentation of the list, and to indicate gaps which might be filled in later editions.

It will be noted that some varieties and strains have not been given any special name, and the words "Selection," "Selected," or "Un-named" appear occasionally in place of the varietal name. Special comment is necessary in this connexion as far as New Zealand is concerned, and some explanatory notes are necessary regarding Swedish varieties.

New Zealand. Our Official Correspondent draws attention to the fact that strains are being bred in New Zealand to cater specifically for the main agricultural rotational systems. The N.Z. strains are selected firstly to be of real value to New Zealand, and secondly to have the maximum agronomic value in at least all mesophytic and temperate climates of the world. The aim is to standardize the nomenclature of each species and to eliminate as far as possible pet names or numbers which must in the end lead to much confusion, both in the trade and in the minds of the consuming farmer. Bred strains must ultimately fit into specific farming systems, and purposeful breeding, to comply with the demands of those systems, must tend to keep the work strictly utilitarian. Thus we have short leys up to 1 year ; temporary pastures up to 2 years ; short rotation pastures up to 4 years ; long rotation pastures up to 9 years ; and truly permanent pastures. It is conceivable that each country may breed types climatically and edaphically attuned within specific geographical boundaries and that some of those types may have very local application. They should nevertheless fit into a farming system within those geographical boundaries. The thesis that "Home grown seeds are best" is based on this conception, but the fact remains that there are vast potentialities for betterment of cropping or for pasture formation by exploiting the possibilities latent in bred strains within a reasonable climatic and edaphic range irrespective of whether those strains are produced in U.S.A., Canada, Great Britain, Russia, Africa, Australia, New Zealand or elsewhere. Within mesophytic and temperate climates, the N.Z. bred strains have a wide general application.

Sweden. While collecting and compiling the Swedish contribution, Dr. Gosta Julén of Svalöf made the following notes: In Sweden all seed testing work is carried out by the State Central Seed Testing Station, Stockholm 19, its branch station in Åkarp, and five local State subsidized seed testing stations. There are different kinds of certificates. Common State sealing and State sealing of qualified seed include a guarantee of a certain germination, ability, purity, content of weed seeds, 1000-grain-weight, and water content according to regulations made by the Royal Agricultural Chamber. For most crops also the name of the respective variety must be given (and for red clover the type: late, medium-late or early) and this is controlled by the Central Seed Testing Station by control growing in the field afterwards. The difference between common State sealing and State sealing of qualified seed concerns a difference as to general quality of the seed (according to the above-mentioned characters) and also as to purity of variety. The two highest forms of State sealing are that with certificate of control growing and that with certificate of original seed, and both are carried out by the Central Station only. They both include control growing the year before the sealing and field inspections and give the best guarantee of varietal purity of all sealings. The last form of sealing is used only for seed grown for the breeder or his representative and for varieties approved by a special Governmental committee. A special State sealing for local registered red clover strains was introduced in 1946.

Swedish Local Strains. It is well known that there are a great number of local strains of *Trifolium pratense* in Sweden. Most of them are adapted only to the rather small district in which they were developed by natural selection. A few—mentioned below—seem to have a wider range of adaptation than others. Concerning all of them (except Offer on one hand, and Ultuna, Harrie and Karaby which have been placed on the market, the former by the General Swedish Seed Co., Svalöf, the latter by both this seed firm and W. Weibull Co.) the seed supply is rather small and certified seed very scarce. From 1946 on, a special form of State sealing for local strains of so-called registered red clover strains was introduced. A few of the best bred strains which had been tested in a sufficient number of trials were selected for this registration. They are now taken over by the Seed Growers' Associations and propagated under State control at special farms, which have contracted not to grow any other red clover strains than the one in question. Only seed grown under control on those farms and certified by the Central State Seed Testing Station has the right to be called registered seed of the respective strain.

Local strains of *Trifolium hybridum* are not so numerous as those of red clover. Under the name of Östgöta are sold several rather similar strains from the province of Östergötland. They are winter hardy and adapted to southern Sweden up to 59°N. lat. Balingsta is a still more winter hardy local strain adapted to middle Sweden up to 61°N. lat. Sidensjö is a strain of quite another type, very low and persistent in the climate of northern Sweden north of 61°N. lat. Certified seed of these strains is occasionally sold by the seed firms but the amount of seed available of the two last mentioned is usually small.

There are also some local strains of *Phleum pratense*, such as Varpnäs, Kolja and Gimo from the western, central and eastern part respectively of middle Sweden. They are very winter hardy, high-yielding and persistent in their respective districts. Certified seed is available only occasionally. Valuable local strains no doubt exist also in northern Sweden, but they have not yet been sufficiently tested.

The area sown to *Hordeum vulgare* in Sweden is about 100,000 hectares. Barley is also grown as a mixed crop together with oats and sometimes also with peas or vetches. The mixed grain crop covers about 300,000 hectares. The mixed crop and about two-thirds of the pure barley crop are used for forage.

	Type	Rachilla hairs	Dorsal lemma teeth
Note :	α	long	absent
	β	long	present
	γ	short	absent
	δ	short	present

* * *

The following are addresses of Swedish seed firms which conduct their own breeding work or which co-operate with plant breeding institutes and sell original seed from bred varieties and strains :

ALLMÄNNA SVENSKA UTSÄDESAKTIEBOLAGET (General Swedish Seed Ltd.), *Svalöf*, co-operating with the Swedish Seed Association.

W. WEIBULL, A.B. (W. Weibull Ltd.), *Landskrona*, with Weibullsholm's Plant Breeding Institute.

OTTO J. OLSON and Son, Ltd., *Hammenhög*. (Seed firm and plant breeding institute.)

ALGOT HOLMBERG and Sons, Ltd., *Norrköping*. (Seed firm and plant breeding institute.)

METHOD OF USING CATALOGUE

There are two main parts.

- Part 1. pp. 1-295. Information received direct from Official Correspondents and specialists in Australia, Canada, Finland, Great Britain, India, Netherlands, New Zealand, Norway, Palestine, Sweden, South and East Africa, and Trinidad.

This information is arranged alphabetically according to genus and species; within species alphabetically according to country; within countries alphabetically according to varietal name.

- Part 2. pp. 297-316. Indication of the Volume and place in *Herbage Abstracts*, Vols. 1 to 17 (1931-47) at which information on a particular variety can be found. References indicate the volume and page number (letters a, b, c, etc. indicate place of abstract on a page) in Vols. 1 to 7; from Vol. 8 onwards, references are to volume and abstract number.

PART I

INFORMATION RECEIVED
FROM CORRESPONDENTS

PAGES 2—295

Agropyron cristatum :	Crested wheatgrass	Fairway, Sask. 1350
Origin	Progeny of a few selected plants from a plot listed as crested wheatgrass, Sask. 316, grown from seed obtained from the U.S.A. Dept. Agric.	
Authority	Field Husbandry Department, University of Saskatchewan, Canada.	
Characteristics	Stems short and fine. Leaves narrow, pointed, abundant. Seeds, light green or greenish brown. Roots, non-creeping. Perennial.	
Adaptation	Temperate climate, with rainfall from 10 to 20 in. ; latitude 44 to 52° N. ; will thrive on a variety of soils from clays to sandy loams.	
Resistance	Resistant to winter killing. No disease or insect pest has given any trouble as yet.	
Use	Used for hay or pasture and for adding fibre to soils for combatting wind erosion. Useful in competing with weeds.	
Certified ?	Yes.	
Grades recognized ?	Yes, on the basis of purity, viability and quality.	
Authority for certification	Canadian Seed Growers' Association and Dominion Department of Agriculture.	
On open market ?	Yes.	

Agropyron cristatum :	Crested wheatgrass	S-11
Origin	Single plant selection from common type, made in 1925.	
Authority	Field Husbandry Department, University of Saskatchewan, Canada.	
Characteristics	Fibrous roots ; culms as tall but finer than in common crested wheat ; 2 to 4 in. taller than Fairway. More leafy than ordinary crested wheat. Panicle and seed are similar to common crested wheat.	
Adaptation	Adapted to semi-arid to fairly humid conditions and soils varying from clays to fine sands in texture. Withstands about 7 to 10 days flooding in the spring and very low winter temperature. Remains	

dormant during hot dry periods. Grows best during cool seasons and prefers comparatively cool climates. Latitude of adaptation is about 40-45° N. to limit of settlement.

Resistance No specific resistance to any disease or pest. Very drought resistant. Very winter hardy.

Use Hay and pasture.

Certified ? No.

Grades
recognized ? No.

On open market ? No.

Agropyron cristatum : **Crested wheatgrass** **S-1250**

Origin Single plant of Fairway selected in 1932 inbred one generation and one S₁ plant clonally propagated and selfed. The clonally propagated S₁ plant and the S₂ progeny were spaced isolated together.

Authority Dominion Forage Crops Laboratory, Saskatoon, Sask., Canada.

Characteristics Fibrous roots, culms 2-4 in. taller than Fairway, and comparatively fine. Considerably more leafy than Fairway. Fairly large leaf and leaf type uniform. Panicle and seed are indistinguishable from Fairway.

Adaptation Adapted to semi-arid to fairly humid conditions and soils varying in texture from clay to fine sands. Withstands only about 7 to 10 days flooding in the spring, but survives very low winter temperature. Remains dormant during hot dry periods. Grows best in cool seasons and regions. Latitude of adaptation is about 40-45° N. to limit of northern settlement.

Resistance No specific resistance to any disease or pests. Very drought resistant, being similar to ordinary crested wheat. Very winter hardy.

Certified ? No.

Grades
recognized ? No.

On open market ? No.

Agropyron cristatum :	Crested wheatgrass	S-1251
Origin	Single open fertilized plant of Fairway selected in 1938. Open fertilized progeny grown and a single plant of the progeny selected and selfed. Best plants of the selfed progeny selected and bulked in isolated seed increase.	
Authority	Dominion Forage Crops Laboratory, Saskatoon, Sask., Canada.	
Characteristics	Fibrous roots, culms 2-4 in. taller than the Fairway variety. Very heavily stooled. Culms comparatively fine. Much more leafy than Fairway. Leaves fairly soft and of a fairly uniform type. Spike and seed are indistinguishable from the Fairway variety.	
Adaptation	Adapted to semi-arid to fairly humid conditions and soils varying in texture from clays to fine sands. Withstands 7 to 10 days flooding in the spring, and very low winter temperatures. Remains dormant during hot dry periods. Prefers a comparatively cool climate and grows best during the cool seasons. Latitude of adaptation 40-45° N. to limit of settlement.	
Resistance	No specific resistance to any disease or pest. Very drought resistant, and winter hardy.	
Use	Hay and pasture. Additional height compared to Fairway makes it more desirable for hay than Fairway.	
Certified ?	No.	
Grades recognized ?	No.	
On open market ?	No.	

Agropyron pauciflorum :	Slender wheatgrass	Fyra
Origin	Selection from native Alberta plants.	
Authority	Department of Field Crops, University of Alberta, Canada.	
Characteristics	A tall-growing bunch grass, with many stems carrying leaves well up towards the usually lax spikes. Upper leaf blades are inserted at angles with the culm of nearly 90°. The plants are rather short-lived perennials.	
Adaptation	Adapted to a variety of soils that are not excessively heavy. Thrives in rather dry conditions and does not tolerate flooding. It will endure lightly alkali soil. Grows well in Alberta, where moisture conditions are suitable, from 49° to 57° N. latitude.	

Resistance	Fyra is almost entirely resistant to smut caused by <i>Ustilago bulloata</i> , and has been under selection for this resistance for several generations. Is drought resistant and thoroughly winter hardy in Alberta.
Use	Primarily a hay grass and may be used for silage or soilage, and presumably would be satisfactory for artificially dried fodder. Not very successful for pasture in the late summer, when its growth is very limited.
Certified ?	No. Produced in very limited quantity only at the University of Alberta.
Grades recognized ?	Yes, on the basis of weed seeds, disease resistance, germination and general appearance, standards being stipulated by the Canadian Seeds Act.
Authority for certification	None other than University of Alberta.
On open market ?	Not at present.

Agropyron pauciflorum : **Slender wheatgrass** **Mecca (1)**
Origin The progeny of a single plant selected in 1923.

Authority Field Husbandry Department, University of Saskatchewan, Canada.

Characteristics Roots fibrous, subject to attack by root rotting organisms. Culms, leaves, spike and seed similar to ordinary slender wheat. Highest hay yield of all strains tested at Saskatoon. Persists 4 to 5 years.

Adaptation For semi-arid to fairly humid conditions, persisting best under sub-humid moist condition. Adapted to clay to sandy loams. Fairly alkali tolerant. Withstands flooding 10 to 14 days ; and very low winter temperature. Latitude of adaptation is about 40° N. to limit of northern settlement.

Resistance No specific resistance to any disease or pests. Less drought resistant than brome grass or crested wheatgrass, but similar to ordinary slender wheat. Very winter hardy.

Use Chiefly for hay, but may also be pastured.

Certified ? Yes.

Grades recognized ? Yes. On the basis of ancestry, isolation of field, germination and weed seed content of seed.

Authority for certification Registered seed is controlled by the Canadian Seed Growers Association, Ottawa, Ontario, and certified seed by the Production Service, Plant Products Department of Agric., Ottawa, Ontario.

On open market ? Yes.

Agropyron tenerum :	Slender wheatgrass	Grazier
Origin	Selection from native strains.	

Authority	Dom. Experimental Station, Scott, Sask., Canada.
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Characteristics	In the first season the growth varies from 4-10 ins., depending on the season. The strain is short and usually there are no flowering stalks. In the second and subsequent years, flowering stalks are numerous, erect, smooth, slender and about 20 in. in height. The leaves are typical of the grass family, i.e. long and narrow, light hellebore in colour and fine in quality. The flowers are attached to a rachis rather laxly and are typical of the grass family. The spikelets are 3-5 flowered and glumes 12-14 mm. long, acute to awn pointed. The seeds have a adhering hull, are 8-11 mm. in length and of a grayish white colour.
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Adaptation	Best adapted to a semi-arid, cool climate with an annual precipitation of about 13 to 15 in., fairly high elevation, and to loam soils. Gives best performance on land which has frequent, non-alkaline depressions.
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Use	Hay, pasture, soil conservation. Slender wheatgrass is useful for hay and pasture for about 4 years. Up to that time, it gives a very good yield, then it gradually dies out and weeds take control.
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Certified ?	Yes.
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Agrostis alba :	Red top	Reton
Origin	Selections from introductions from Scandinavia, Russia, Central Europe, Great Britain, U.S.A. and Canada.	

Authority	Department of Field Husbandry, Ontario Agricultural College, Canada.
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Characteristics	Stems are taller and more erect than in the commercial strains. Leaves are long, medium in width and more numerous than in commercial strains. Flower has open panicle, slightly more spreading than commercial strains. Spikelets have reddish-brown cast characteristic of species. Seed similar in size shape and colour to that of commercial strains. More vigorous with increased nutritional value over average commercial type.
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Agrostis tenuis :	Browntop	See note on page vi
Origin	Certification applies to type as defined by plot trial and to freedom from Red top (<i>Agrostis alba</i>).	
Authority	Grasslands Division, Plant Research Bureau, Dept. Sci. Ind. Res., New Zealand.	
Characteristics	Dense turf former, fine foliage, moderate leaf production of fair palatability.	
Adaptation	Wide edaphic range under moderate to heavy rainfall, temperate to sub-frigid climatic range.	
Resistance	Relative free from diseases in N.Z.	
Use	Sheep and cattle pastures on 2nd class wet hill country. Used extensively for lawns, playing greens and aerodrome turfs.	
Grades recognized ?	N.Z. Certified brown top. N.Z. Uncertified brown top.	
Authority for certification	Department of Agriculture.	
On open market ?	Certified and uncertified stocks commercially available.	

Brown top (*Agrostis tenuis*) is the most common representative of the genus in N.Z., and dominates large areas of second class, moist to wet, stiff loamy soils. It has been sown extensively on steep, high rainfall (40-120 in.) hill country where it provides moderate sheep and cattle grazing. It is a volunteer, successional species in much short and long-rotation country, from which areas seed is harvested.

Andropogon sorghum :	Bilichigan	Selection
Origin	Selected from Mudinandyal.	
Authority	Deputy Director of Crop Research, Poona, India (Bombay Province).	
Characteristics	Very tall thin stem.	
Adaptation	Varying rainfalls. Medium black soil. Lat. 16° N. Long. 74-75° E.	
Resistance	Somewhat resistant to drought.	
Use	Stalks and leaves for hay.	

Certified ? Yes.

Grades recognized ? Yes.

On open market ? No.

Andropogon sorghum :	Fulgar white	Selection
Origin	Selected from local strain.	

Authority	Deputy Director of Crop Research, Poona, India (Bombay Province).
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Characteristics	Tall thick stem, white grain.
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Adaptation	Good rainfall. Medium black soil. Lat. 16° N. Long. 74-75° E.
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Resistance	Not particularly resistant.
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Use	Stalks and leaves for hay.
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Certified ? Yes.

Grades recognized ? Yes.

On open market ? No.

Andropogon sorghum :	Fulgar yellow Haldi fulgar	Selected
Origin	From local Haldi Fulgar.	

Authority	Deputy Director of Crop Research, Poona, India (Bombay Province).
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Characteristics	Tall stout stem, coarse fodder.
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Adaptation	Good rainfall. Medium black soil. Lat. 16° N. Long. 74-75° E.
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Resistance	Suffers from drought.
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Use	Stalks and leaves for hay.
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Certified ? Yes.

Grades recognized ? Yes.

On open market ? No. .

Andropogon sorghum :	Jowar	B.P. 53
Origin	Selection.	

Authority	Cotton Breeder, Surat, India (Bombay Province).
Characteristics	Rather late.
Adaptation	30" to 50" rainfall. Rich soil. Lat. 18° N. Long. 73° E.
Resistance	None.
Use	For hay.
Certified ?	No.
Grades recognized ?	Yes.
On open market ?	No.

Andropogon sorghum :	Jowar	Broach No. 8
Origin	Selected from Broach.	

Authority	Cotton Breeder, Surat, India (Bombay Province).
Characteristics	Dwarf, sweet stem, broad leaves.
Adaptation	Winter crop. Black cotton soil. Lat. 18° N. Long. 73° E.
Resistance	None noted.
Use	Hay of stalks and leaves.
Certified ?	No.
Grades recognized ?	Yes.
On open market ?	No.

Andropogon sorghum :	Jowar	Budh Perio 53
Origin	Selected Surat Budh Perio.	

Authority	Cotton Breeder, Surat, India (Bombay Province).
Characteristics	Pearly grain.
Adaptation	30 to 50 inches rainfall. Deep black soil. Lat. 18° N. Long. 73° E.

Andropogon sorghum :	Jowar Chhosatio	No. 10-2
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Origin	Selected from local chhosatio.
Authority	Cotton Breeder, Viramgam, India (Bombay Province).
Characteristics	Semi-compact earhead, and early.
Adaptation	Black soils of N. Gujarat. Lat. 16° N. Long. 74-75° E.
Resistance	Partially resistant.
Use	For hay and silage.
Certified ?	Yes.
Grades recognized ?	Yes.
On open market ?	No.

Andropogon sorghum :	Nandyal	Selection
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Origin	Selected from Nandyal.
Authority	Deputy Director of Crop Research, Poona, India (Bombay Province).
Characteristics	Tall thin stem.
Adaptation	Under wide range of medium rainfall, black soil. Lat. 16° N. Long. 74-75° E.
Resistance	None observed.
Use	Stalks and leaves for hay.
Certified ?	Yes.
Grades recognized ?	Yes.
On open market ?	No.

Andropogon sorghum : **Juar** **Improved Ramkel Juar**

Origin	A selection from local Ramkel Juar.
Authority	Department of Agriculture, C.P., and Berar, Nagpur, India.
Characteristics	Stem thin, erect, internodes 4'' to 6'' in length. Annual ; at the end of season height ranges from 4' to 10' according to soil and climatic conditions ; stem smooth. Practically no branching except for a few culms in only a few plants. Leaves elongated, pointed, ligule present, venation parallel, margin entire but slightly serrated in young stage. Leaf is green but when old or dried becomes pale yellow and droops. Length of fully mature leaf ranges from 1' to 4' with 2'' to 3'' width in the middle. Leaves alternate. Flowers in small spikes. Complete inflorescence enclosed in sheath. Flower head rather loose in character compared with other common juars. Seed round, white and approx. 1/10'' size which varies according to soil and climatic conditions. Annual kharif (rainy season) crop sown at end of June or beginning of July, i.e. after 3'' to 4'' of monsoon rains. Flowers in about 4 months and is ready for harvest within 5 to 6 months, for fodder when the grains are in milky stage and for grain when completely ripe. Generally harvested in a single cut but a small second harvest may be taken if the first is taken before flowering.
Adaptation	Mainly suited for lighter soils and does well in tracts of low rainfall, i.e. 25 to 40 in.
Use	Useful as green fodder when grains in milky stage. After chaffing can be turned into silage. After artificially drying it is chaffed and used as fodder.
Certified ?	Yes.
Grades recognized ?	Yes. On basis of size of seed germination, etc.
Authority for certification	Director of Agriculture, Central Provinces and Berar, Nagpur.

Andropogon sorghum :	Juar	Improved Ringni Juar
Origin	Selected from a local variety " Ringni " (a winter season variety).	
Authority	The Second Economic Botanist to the Government C.P., and Berar, Nagpur, India.	
Characteristics	Stem up to 8 ft. tall, slender, smooth, light bloom, leaf sheath encircles stem. Red purple patches on sheath and leaves. Leaves elongated, pointed at apex, up to 3 ft. long and 3'' to 4'' wide, mid-rib white. Bluish green foliage. Head stalk is goose-necked or bent and wavy. Short stout. Head ovate, compact, spikelets ovate, tawny. Glumes equal, clasped to seed, hairy red-purple at flowering time, and white straw coloured on maturity. Seed is obovate, pale yellow, about one tenth of an inch long. Almost half enclosed in glumes. Annual herb, grown in winter season. Sown in September-October and is ready for harvest as fodder in February or March. Single cut is obtained.	
Adaptation	Grown on medium or heavy soils with a rainfall of 20'' to 40'' and having short winter season, climate sub-tropical. Latitude of the province where it is grown 15°-24°N.	
Resistance	Not known.	
Use	Hay, silage, green fodder (soilage).	
Certified ?	Yes.	
Grades recognized?	No.	
Authority for certification	Director of Agriculture, Central Provinces and Berar, Nagpur.	

Andropogon sorghum :	Great Millet	Jowar or chari	J.S.20
Authority	Fodder Specialist, Government of Punjab, India.		
Characteristics	A thin-stemmed, leafy, tall-growing, mid-season and heavy yielding variety with lax but erect ears. Grains roundish, brown, with purple glumes which cover them entirely.		
Adaptation	Successfully sown in all parts of the Province except high hills and dry, sandy tracts. Can grow on all types of soil but loam to heavy loam soils suit it best.		

Cultivated under irrigated and non-irrigated conditions. A summer crop, and can be sown from mid-March to mid-August. Warm climate is best.

Resistance Susceptible to fungous diseases (smut and red leaf spot). Also readily attacked by stem borer as well as *Striga*. Fairly drought resistant.

Use. Usually cut and fed green but can be easily dried or made into silage. Mostly grown in mixture with guara (cluster beans).

Certified ? Yes.

Grades recognized ? No.

Authority for
certification Department of Agriculture, Punjab.

Andropogon sorghum : **Great Millet** Jowar or chari **J.S.21**
Authority Fodder Specialist, Government of Punjab, India.

Characteristics A sweet, tall-growing, mediumly thick-stemmed, mid-season, heavy-yielding variety with erect but lax head. The grain is round, and medium in size. Grain is creamy with brown dots on the top. The straw-coloured glumes almost cover the grain.

Adaptation Successfully sown in all parts of the Province except high hills, dry, sandy tracts. Can grow on all types of soil but loam to heavy loam soils suit it best. Cultivated under irrigated and non-irrigated conditions. A summer crop, and can be sown from mid-March to mid-August. Warm climate is best.

Resistance Susceptible to fungous diseases (smut and red leaf spot). Also readily attacked by stem borer as well as *Striga*. Fairly drought resistant.

Use Can be fed green or made into silage but the dry fodder does not keep long.

Certified ? Yes.

Grades recognized ? No.

Authority for
certification Department of Agriculture, Punjab.

Andropogon sorghum : **Great Millet Jowar or chari** **J.S. 100**
 Authority Fodder Specialist, Government of Punjab, India.

Characteristics A sweet, tall-growing selection with broad leaves and mediumly thick stems, erect but compact heads, attractive, medium-sized and creamy coloured grains. The straw-coloured glume covers one third of the grain.

Adaptation Successfully sown in all parts of the Province except high hills and dry, sandy tracts. Can grow on all types of soil but loam to heavy loam soils suit it best. Cultivated under irrigated and non-irrigated conditions. A summer crop, and can be sown from mid-march to mid-August. Warm climate is best.

Resistance Susceptible to fungous diseases (smut and red leaf spot). Also readily attacked by stem borer as well as *Striga*. Fairly drought resistant.

Use Can be fed green or made into silage but the dry fodder does not keep long.

Certified ? Yes.

Grades recognized? No.

Authority for certification Department of Agriculture, Punjab.

Avena sativa : **Oats** **Algeribee**
 Origin Selected from Algerian.

Authority Dept. Agric., Victoria, Australia.

Characteristics Like Algerian but has more rapid spring growth and is slightly earlier.

Use All purposes in areas of fair to good rainfall.

On open market ? Yes.

Avena sativa : **Oats** **Ballidu**
 Origin Mulga $\times$ Burt's Early.

Authority Dept. Agric., West Australia.

Characteristics Early, good straw, and fair recovery after grazing.

Use Early green feed, hay, and grain.

On open market ? Yes.

Avena sativa :	Oats	Belar
Origin	Selected from Sunrise.	
Authority	Dept. Agric., N. S. Wales, Australia.	
Characteristics	Midseason, tall, with fair straw.	
Resistance	To oat smut and moderate resistance to stem rust.	
Use	Early green feed, hay and silage.	
On open market ?	Yes.	

Avena sativa :	Oats	Buddah
Origin	Selected from Sunrise.	
Authority	Dept. Agric., N. S. Wales, Australia.	
Characteristics	Very early, medium tall, recovers fairly well after grazing, under good conditions.	
Resistance	To stem rust and smut.	
Use	Early green feed.	
On open market ?	Yes.	

Avena sativa :	Oats	Burke
Origin	Selected from Kherson.	
Authority	Dept. Agric., Victoria, Australia.	
Characteristics	Midseason to early, slender straw.	
Resistance	To stem rust.	
Use	Grazing, grain, hay and silage.	
On open market ?	Yes.	

Avena sativa :	Oats	Certified Algerian
Origin	Single plant selected from Algerian.	
Authority	Dept. Agric., Tasmania.	
Characteristics	Like Algerian, more prostrate, finer leaves, denser tillers.	
Use	All purposes in areas of fair to good rainfall.	
On open market ?	Yes.	

Avena sativa :	Oats	Crossbred MS. 126
Origin	Palestine × Dawn.	
Authority	Dept. Agric., Victoria, Australia.	
Characteristics	Early, rapid growth, excellent recovery after grazing.	
Resistance	Adapted to lower rainfall areas of Victoria. Drought resistant.	
Use	Grain and green feed.	
On open market ?	In limited quantities.	

Avena sativa :	Oats	Dale
Origin	Mulga × Burt's Early.	
Authority	Dept. Agric., West Australia.	
Characteristics	Midseason with fair straw.	
On open market ?	Yes.	

Avena sativa :	Oats	Dawn
Origin	Selected from Sunrise.	
Authority	Dept. Agric., Victoria, Australia.	
Characteristics	Midseason, early, erect growth, tillers well.	
Resistance	Drought resistant.	
Use	Hay and grazing, grain, and silage.	
On open market ?	Yes.	

Avena sativa :	Oats	Gidgee
Origin	White Ligowo × Algerian.	
Authority	Dept. Agric., Victoria, Australia.	
Characteristics	Very early with tall medium coarse straw. Not suitable for grazing nor in areas where stem rust is severe.	
Use	Grain and hay in drier districts.	
On open market ?	Yes.	

Avena sativa :	Oats	Guyra
Origin	Algerian × White Ligowo.	
Authority	Dept. Agric., Victoria, Australia.	
Characteristics	Midseason.	
Resistance	Drought resistant.	
Use	Grain and hay.	
On open market ?	Yes.	

Avena sativa :	Oats	Lampton
Origin	Abruzzes × Victory × Reid.	
Authority	Dept. Agric., Victoria, Australia.	
Characteristics	Late, not well adapted to grazing, tall, medium slender straw.	
Resistance	To stem rust and smut.	
Use	Grain and hay.	
On open market ?	Yes.	

Avena sativa :	Oats	Mulga
Origin	Selected from Sunrise.	
Authority	Dept. Agric., Victoria, Australia.	
Characteristics	Very early, medium tall, does not recover well after grazing.	
Resistance	To stem rust and oat smut.	
Use	Grain, hay or silage and early green feed in wheat and dairying districts.	
On open market ?	Yes.	

Avena sativa :	Oats	Sunrise
Origin	Selected in Australia from Algerian.	
Characteristics	Very early, tall, medium coarse stems.	
Resistance	To stem rust and smut.	
Use	Early green feed.	
On open market ?	Yes.	

Avena sativa :	Oats	Wongan
Origin	Mulga × Burt's Early.	
Authority	Dept. Agric., West Australia.	
Characteristics	Very early, short, strong straw.	
Use	Early green feed and grain.	
On open market ?	Yes.	
Avena sativa :	Oats	Eho
Origin	Produced from a cross between Kytö and Stjärn.	
Authority	Plant Breeding Station, Tammisto, Finland.	
Characteristics	Panicle long and dense. Grain white, big, and very thin-hulled (23 per cent). Hectolitre-weight a little lower than that of Golden Rain II. The straw is medium-sized. Ripens about 2-3 days earlier than Golden Rain II and is thus a second early oat. Strong straw.	
Adaptation	Thrives well under varied conditions.	
Resistance	Specially resistant to drought.	
Use	A productive fodder oat and well suited also as a hulled oat. Good yield in spite of earliness.	
On open market ?	Yes, marketed in 1946.	
Avena sativa :	Oats	Kultasade II (Golden Rain II)
Origin	Derived in Finland from the cross of Kultasade × Voitto.	
Authority	Plant Breeding Station, Svalöf, Sweden, [grown in Finland.]	
Characteristics	Leafy panicle (2-3 seeds). The grain yellow and long (35 gr.) and rather thin-hulled (24 per cent.) Hectolitre weight high (56 kg.). A late variety. The straw is rather strong (8).	
Adaptation	Thrives in all soils, being the most popular oat variety in Finland.	
Resistance	Resistant to drought.	
Use	Valuable as fodder and as a hulled oat.	
On open market ?	Yes.	

Avena sativa :	Oats	Kytö
Origin	Derived from a cross Kultasade × a Finnish wild oat.	
Authority	Plant Breeding Station, Tammisto, Finland.	
Characteristics	The grain is yellow, of average size (1000 grain wt.= 33 gr.), generally 3 grains per spikelet, tapering, the amount of hulls (25 per cent) and hectolitre weight (52 kg.) being average. Straw is short, and very strong (9.5). The variety belongs to the second early oats.	
Adaptation	Particularly suitable for the middle part of Finland. Thrives well in boggy soil as it has a strong straw.	
Use	An important fodder oat, but only average as hulled oat. One of the most popular oats in Finland.	
On open market ?	Yes.	
Avena sativa :	Oats	Orion II
Origin	Derived in Finland from crossing of Ligowo × Norrbotten.	
Authority	Plant Breeding Station, Svalöf, Sweden, [Grown in Finland.]	
Characteristics	The panicles are large (spikelets with 2-3 grains). The grain is brown, flat and long (1000 grain wt.= 37 gr.), chaffy and thick-hulled (28 per cent). Average hectolitre weight (52 kg.) very early variety. Straw strength fair (7.5).	
Use	An important fodder oat in North Finland because of its earliness.	
On open market ?	Yes.	
Avena sativa :	Oats	Tammi
Origin	Derived from the cross Esa × Kytö.	
Authority	Plant Breeding Station, Tammisto, Finland.	
Characteristics	The grain is white, of medium size (34 gr.), well-filled, thin-hulled (22.5 per cent). Hectolitre weight is rather high (55 kg.). A second early oat. Straw very strong.	
Adaptation	Suitable for middle parts of Finland, and thrives in boggy soil, because of strong straw.	
Use	Valuable as fodder and as a hulled oat in Middle Finland conditions. In spite of earliness, it yields good crops.	
On open market ?	Yes.	

Avena sativa :	Spring oat	Ceirch-du-bach S79
Origin	Selection from the old land variety Ceirch-du-bach.	
Authority	Welsh Plant Breeding Station, Wales, Great Britain.	
Characteristics	Grain black, short, plump and rather small with whitish tip. Basal hairs few to many, brownish and slightly tufted. Panicle fairly large and spreading. Young plants with narrow leaves, hardy, and tillering freely.	
Adaptation	For soils of below average fertility. Is one week earlier in ripening and produces on an average from 5-9 per cent more grain than the original parent variety. Straw also is shorter, stouter and less liable to lodge.	
Use	Recommended as an improved Ceirch-du-bach for soils similar to those on which the old variety is generally grown.	
Certified ?	Yes.	
Grades recognized?	Two, Certified A and Certified B.	
Authority for certification	Welsh Plant Breeding Station in conjunction with Seed Growers' Associations.	
On open market ?	Stocks are now in short supply.	

Avena sativa :	Winter oat	Aberystwyth S 81
Origin	Derived from cross between Grey Winter and Kyko made in 1920.	
Authority	Welsh Plant Breeding Station, Wales, Great Britain.	
Characteristics	Grain white, panicle smaller and less open than in S147, with shorter internodes. Tendency for spikelets on lower whorl to be sparse. Rachis fairly stiff, erect, spikelets slender. Awns rare. Straw fairly stout.	
Adaptation	For soils of average fertility.	
Resistance	More resistance to lodging than Grey Winter, but similar in winter hardiness and in resistance to attack by stem eelworm.	

Avena sativa :	White winter oat	Aberystwyth S147
Origin	From cross, made in 1924, between Grey Winter and Marvellous.	
Authority	Welsh Plant Breeding Station, Wales, Great Britain.	
Characteristics	Grain white, panicle open, medium to large, with stiff and more erect branches than Grey Winter. Glumes silvery green in contrast to more yellowish green of Grey Winter. Has inherited the winter hardiness, high kernel content of Grey Winter combined with good strength of straw, larger grain size and yielding ability of Marvellous.	
Adaptation	For well-drained soils of good or average fertility where grain yield expectation is from 18 to 36 cwt. per acre.	
Resistance	Not resistant to stem eelworm. Straw stout and resistant to lodging.	
Use	As a white winter oat is second to none regarding yield and quality of grain.	
Certified ?	Yes.	
Grades recognized ?	Two: Certified A and Certified B.	
Authority for certification	Welsh Plant Breeding Station in conjunction with Seed Growers' Associations.	
On open market ?	Yes.	

Avena sativa :	Winter oat	Aberystwyth S172
Origin	From cross between two white-grained selections respectively derived from the offspring of the crosses Grey Winter × Kyko and Grey Winter × Bountiful.	
Authority	Welsh Plant Breeding Station, Wales, Great Britain.	
Characteristics	Grain white. Short, very stiff straw. Panicle open, with short, stiff and mainly horizontal or slightly ascending branches. Spikelets small. Grain small, pointed, usually free of awns. High tillering capacity.	

Adaptation	A special-purpose variety for soils of high fertility where straw growth is generally excessive, and the more usual types lodge. For soils where yields of 25-45 cwt. per acre are expected.	
Resistance	High lodging resistance.	
Use	Because of relative shortness of straw and high tillering capacity, not advisable to graze in spring except on very rich soils, retentive of moisture.	
Certified ?	Yes.	
Grades recognized ?	Two, Certified A and Certified B.	
Authority for certification	Welsh Plant Breeding Station in conjunction with Seed Growers' Associations.	
On open market ?	Yes.	
Avena sativa :	Spring oat	Aberystwyth S175
Origin	From a cross between Victory and the hardy Swedish oat Black Bell III.	
Authority	Welsh Plant Breeding Station, Wales, Great Britain.	
Characteristics	Grain white and of good quality. One-sided panicle ; long, erect straw. Spikelets regularly 2-grained. Leaf sheaths and leaf margins glabrous.	
Adaptation	For soils of average fertility. Recommended for land of average cropping capacity and for areas described as good "barley and sheep land." Succeeds on dry, stony soils in good heart. Should not be sown on heavily-dunged soils or on old land with a deep, moist, or peaty type of soil because of its high straw-producing capacity.	
Resistance	Moderately resistant to mildew.	
Use	Long, stiff straw readily consumed by stock. Grain is of good size, and tillering capacity is low and therefore it should be sown at not less than 200-220 lb. per acre.	
Certified ?	Yes.	
On open market ?	Yes, marketed in 1938.	

Avena sativa :	Spring oat	Aberystwyth S220
Origin	From a cross between Victory and Radnorshire Sprig.	
Authority	Welsh Plant Breeding Station, Wales, Great Britain.	
Characteristics	A hardy, good tillering variety which ripens fairly early. Panicle open, of good size and medium dense, grain black, fairly long. Leaf sheaths and margins glabrous. Rachilla glabrous. Straw medium long and fine, but slightly stouter than Radnorshire Sprig.	
Adaptation	For soils of average or below average cropping capacity.	
Resistance	Hardy, more resistant to lodging than Radnorshire Sprig.	
Use	A reliable crop for soils of only moderate fertility giving high yields of good average grain and a good grain to straw ratio.	
Certified ?	Yes.	
Grades recognized ?	Two, Certified A and Certified B.	
Authority for certification	Welsh Plant Breeding Station in conjunction with Seed Growers' Associations.	
On open market ?	Yes, in spring of 1945.	
Avena sativa :	Oats	Algerian
Origin	—	
Authority	Fodder Specialist, Government of Punjab, India.	
Characteristics	Spreading habit at early stage of growth. Leaves are shorter and less broad than Weston. Good tillering variety. Panicle is about the same length as in French oats. Spikelets are awned. The awns are deflexed at the base and brown. The grains are better filled than in other oat varieties.	
Adaptation	Late-maturing type and gives good results even under unirrigated and poor soil conditions.	
Resistance	Susceptible to smut, stem rust and leaf stripe. Fairly drought resistant.	
Use	Cut and fed green and can easily be turned into silage and hay. The grain is used as concentrate for cattle and horses.	

Certified ?	Yes.	
Grades recognized ?	No.	
Authority for certification	Department of Agriculture, Punjab.	
Avena sativa :	Oats	French Husked
Origin	—	
Authority	Fodder Specialist, Government of Punjab, India.	
Characteristics	Semi-erect in habit in early stages of growth. Can grow as tall as the Weston 11 oat, but the stems are thicker and the leaves are broader than the latter. Panicle is 1 to 1.5 ft. long. Spikelets are awned, dark in colour and twisted at the base. The grains are whitish and lightly filled.	
Adaptation	Late maturing. Does well under irrigated and good soil conditions. Sowing time is same as in Weston 11. [p. 29]	
Resistance	Susceptible to smut, stem rust and leaf stripe. Fairly drought resistant.	
Use	Cut and fed green and can easily be turned into silage and hay. The grain is used as concentrate for cattle and horses.	
Certified ?	Yes.	
Grades recognized ?	No.	
Authority for certification	Department of Agriculture, Punjab.	

Avena sativa :	Oats	Imperial Pusa Hybrid 1
Origin	Hybridization between Imperial Pusa 2 and Scotch Potato oats.	
Authority	Bot. Sect., Imp. Agric. Res. Inst., New Delhi, Indla.	
Characteristics	Strong stem with stiff straw. About 4 to 5 ft. tall. Profuse tillering. Long and broad leaf. Two fertile and one abortive floret in each spikelet. Yellowish white, plump seed. Heavy yielding variety with plump and attractive seeds ; does not lodge under ordinary conditions. Midseason maturity.	
Adaptation	Does well on loamy soils or clay loams in Northern India, at about 24° to 32° N. latitude, with an average annual precipitation of 25-60 in. or more. Better suited than Imperial Pusa 1 to tracts with high rainfall and/or irrigated conditions.	
Resistance	Resistant to smut but susceptible to drought. Has not responded to vernalization.	
Use	Plants used for green fodder and/or hay. Grains used as a concentrate for cattle or horses.	
Certified ?	Botanically pure seeds are produced.	
Grades recognized ?	No.	
Avena sativa :	Oats	Imperial Pusa Hybrid 2
Origin	Hybridization between Imperial Pusa 4 and Scotch Potato oats.	
Authority	Bot. Sect., Imp. Agric. Res. Inst., New Delhi, India.	
Characteristics	Strong stem with stiff straw. About 4 to 5 ft. tall. Profuse tillering. Long and fairly broad leaf. Two fertile and one abortive floret in each spikelet. Yellowish white seed, plump but smaller in size than those of Imperial Pusa hybrid 1. Thin seed-coat. Heavy yielding with stiff straw. Midseason maturity.	
Adaptation	Does well on loamy soils in Northern India, at about 24° to 32° N. latitude, with an average annual precipitation of 25 to 60 in. or more.	
Resistance	Highly resistant to smut but susceptible to drought.	

Use Plants used for green fodder and/or hay. Grains used as a concentrate for cattle or horses.

Certified ? Botanically pure seeds are produced.

Grades
recognized ? No.

Avena sativa : — **Oats** **Weston 11**
Origin

Authority Fodder Specialist to Government of Punjab, India.

Characteristics Heavy yielding and mediumly tillering type. During early stages has a spreading habit ; later, however, it grows straight and attains a height of 5 to 6 ft. or even more. Leaves are linear lanceolate, dark green. They may be 30 to 40 cm. long and 2 to 2.5 cm. broad. Leaf margins are non-hairy. Panicle is 1.5 ft. long and the spikelets are awned. The awns are straight and white. A husked variety. The grain is rather lightly filled and small in size.

Adaptation Grown throughout the Province for fodder under irrigation. Can also be grown under irrigated conditions where rainfall exceeds 25 in. Successfully grown in all except light sandy soils. Heavier type of loams are best. Sown from the middle of October to the end of December. Early maturing.

Resistance Susceptible to smut, stem rust and leaf stripe. Fairly drought resistant.

Use Cut and fed green and can easily be turned into silage and hay. The grain is used as concentrate for cattle and horses.

Certified ? Yes.

Grades
recognized : No.

Authority for
certification Department of Agriculture, Punjab.

Avena sativa :	Oats	" Strain 17." Not yet named
Origin	Developed from the cross_ (Ruakura × Gartons Abundance).	
Authority	R. A. Calder, New Zealand.	
Characteristics	A quick growing early oat with a fine straw and a white grain suitable for grazing, for chaff or for milling purposes. Early habit ; erect, tillering fair, foliage light green. Straw fine and clean but not stiff and with a tendency to lodge. Panicle open. Grain long, plump and white with a yellowish tinge ; husk percentage a little higher than that of Gartons Abundance.	
Adaptation	Suited more particularly for temperate latitudes and, within such zones, more particularly for light land which tends to dry out as the summer advances. " Strain 17 " being an early oat has a better chance than later maturing varieties of reaching maturity before the soil becomes too dry and thus of producing more satisfactory yields.	
Resistance	Although the cross was made for the purpose of attempting to develop an Abundance type resistant to leaf rust (<i>Puccinia coronata avenae</i>) it exhibits no marked resistance either to leaf rust, to stem rust (<i>P. graminis avenae</i>) or to loose or to covered smut (<i>Ustilago avenae</i> and <i>U. levis</i>).	
Use	Can be used either for grazing, for chaff or for milling purposes.	
Certified ?	Not yet undertaken.	
On open market ?	No stocks yet available commercially.	
Avena sativa :	Oats	Mulga Fulghum
Origin	Australia, grown in Palestine.	
Characteristics	Very tall and rapid growth.	
Adaptation	Adapted to all Palestine. Autumn and winter growth. With and without irrigation.	
Resistance	Susceptible to rust.	
Use	Soilage, hay, pasture.	
Certified ?	No, not officially.	

Grades recognized? No.

Authority for certification Seed Committee (a semi-official body including representatives of the Dept. Agric., the Jewish Agency, Field Crop Growers' Assoc., and of "Hazara" Seed Producers' Co-operative).

On open market? Yes.

Avena sativa :	Oat	Argus
Origin	Out of a cross between Seger (Victory) and a selection in Stormogul.	
Authority	Weibullsholm Plant Breeding Institution, Landskrona, Sweden.	
Characteristics	A black oat, high yielding, and with good quality. Bushel weight and kernel percentage very high. Grain short, plump and deep black in colour. Straw rather stiff.	
Adaptation	Southern and Middle Sweden.	
Use	Fodder.	
Certified?	Yes.	
Grades recognized?	Original seed sold only by W. Weibull Ltd. Also other seed in the market. For different qualities see page vii.	
Authority for certification?	The State Central Seed Control Station.	
On open market?	Yes, also for export.	

Avena sativa :	Oat	Bambu
Origin	Out of the cross (Abundance $\times$ Seger) $\times$ white oat selected in Argus.	
Authority	Weibullsholm Plant Breeding Institution, Landskrona, Sweden.	
Characteristics	A white oat, early, high yielding and with very stiff straw and good quality.	
Adaptation	Southern and Middle Sweden.	
Use	Fodder.	
Certified ?	Yes.	
Grades recognized ?	Original seed sold only by W. Weibull Ltd. Also other seed in the market. For different qualities see page vii.	
Authority for certification	The State Central Seed Control Station.	
On open market ?	Yes, also for export.	

Avena sativa :	Oat	Engelbrekt II
Origin	Out of the cross Klock II $\times$ Stormogul I.	
Authority	Swedish Seed Association, Ultuna Branch Station, Uppsala, Sweden.	
Characteristics	Leaves narrow, blue-green, without marginal hairs. Good tillering capacity. Straw stiff, hair at the uppermost node lacking. Panicle medium long, yellow-green with stiff branches. Glumes long, broad. Spikelets generally two-flowered. Grain black or slightly brown-black, rather plump. The pubescence of the base of the grain and of the rachillae varies considerably even in the same panicle. Awn generally present.	
Adaptation	Typical black oat for the heavy and dry clay soils in central Sweden.	
Use	Fodder.	
Certified ?	Yes.	

Grades recognized ?	Original seed sold only by the General Swedish Seed Ltd., Svalöf. Also other seed on the market. For different qualities see page vii.
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Authority for certification	The State Central Seed Control Station.
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On open market ?	Yes. Also for export.
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Avena sativa :	Oat	Extra Klock (Extra Bell)
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Origin	Out of the cross Seger × Klock III.
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Authority	Swedish Seed Association, Svalöf, Sweden.
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Characteristics	Leaves broad, vigorous, erect, especially during the tuft stage light green, usually without hairs at the margin and at the base. Straw fairly short, the uppermost node generally with a few hairs. Panicle equally branched all round with stiff branches standing out. Glumes fairly long. Spikelets often three-flowered. The outer grain mostly with awn and as a rule with two tufts of short hair at the base. Rachilla generally smooth. Grain pure black, large and plump, with an exceptionally good quality for a black-oat variety.
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Adaptation	On not too heavy and dry clay soils in central Sweden.
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Use	Fodder.
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Certified ?	Yes.
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Grades recognized ?	Original seed sold only by the General Swedish Seed Ltd., Svalöf. Also other seed on the market. For different qualities see page vii.
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Authority for certification	The State Central Seed Control Station.
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On open market ?	Yes. Also for export.
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Grades recognized ?	Original seed sold only by the General Swedish Seed Ltd., Svalöf. Also other seed in the market. For different qualities see page vii.
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Authority for certification	The State Central Seed Control Station.
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On open market ?	Yes. Also for export.
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Avena sativa :	Oat	Orion II
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Origin	Out of a cross between Ligowo and a local variety of black oat from Merö in northern Norway.
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Authority	Swedish Seed Association, the Upper Norrland Branch Station, Luleå, Sweden.
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Characteristics	Leaves broad, vigorous, much dependent, dark green, in the margin of the lower part of the leaf one to several hairs, mostly hairs also at the leaf base. Panicle grey-green with slightly dependent, fairly long, branches. Glumes comparatively long, broad with ripening white-yellow. Spikelets mostly three-flowered. Grain long, broad, dark black-brown, with short or sometimes without hairs at the base. Awn generally present; rachilla smooth. Straw medium stiff. Early.
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Adaptation	On sandy soils and soils rich in humus in southern and central Norrland.
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Use	Fodder.
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Certified ?	Yes.
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Grades recognized ?	Original seed sold only by the General Swedish Seed Ltd., Svalöf. Also other seed on the market. For different qualities see page vii.
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Authority for certification	The State Central Seed Control Station.
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On open market ?	Yes. Also for export.
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Avena sativa :	Oat	Orion III
Origin	Oat of the cross Guldregn II × Orion II.	
Authority	Swedish Seed Association, Svalöf, Sweden.	
Characteristics	Leaves fairly broad, dark green to grey-green, slightly hairy at the base and margin. Straw stiff. Grain plump, without awn and with no or a few very short hairs at the base. Rachilla smooth. Higher yielding and with stiffer straw and better grain quality than Orion II. A little later than Same.	
Adaptation	In southern Norrland.	
Use	Fodder.	
Certified ?	Yes.	
Grades recognized ?	Original seed sold only by the General Swedish Seed Ltd., Svalöf. Also other seed on the market. For different qualities see page vii.	
Authority for certification	The State Central Seed Control Station.	
On open market ?	Yes. Also for export.	

Avena sativa :	Oat	Örn (Eagle)
Origin	Out of the cross Seger × v. Lockows Gelbhafer.	
Authority	Swedish Seed Association, Svalöf, Sweden.	
Characteristics	Leaves dark green ; straw medium long to short, very stiff, with a tendency to ripen late in wet years ; very good tillering capacity but with a tendency to produce late shoots under unfavourable conditions ; grain small, slightly yellow and fairly plump. Very high yielding capacity and high fodder value due to low husk content. Rather late.	
Adaptation	Southern Sweden, Denmark and other countries with similar climatic conditions.	
Resistance	Resistant to attack by fritfly.	
Use	Fodder.	

Certified ?	Yes.
Grades recognized ?	Original seed sold only by the General Swedish Seed Ltd., Svalöf. Also other seed in the market. For different qualities see page vii.
Authority for certification	The State Central Seed Control Station.
On open market ?	Yes. Also for export.

Avena sativa :	Oat	Primus II
Origin	Out of the cross Seger × Gopher.	
Authority	Swedish Seed Association, Värmland Branch Station, Varpnäs, Sweden.	
Characteristics	Straw fairly stiff. Grain large, pure white without awn. Early.	
Adaptation	Humus and peat soils in southern and central Sweden and in the northernmost and most exposed parts of the cultivation area of white oats.	
Use	Fodder.	
Certified ?	Yes.	
Grades recognized ?	Original seed sold only by the General Swedish Seed Ltd., Svalöf. Also other seed on the market. For different qualities see page vii.	
Authority for certification	The State Central Seed Control Station.	
On open market ?	Yes. Also for export.	

Avena sativa :	Oat	Same
Origin	Out of a cross between Orion II and a local variety of black oat from Norrbotten.	
Authority	Swedish Seed Association, Upper Norrland Branch Station, Luleå, Sweden.	
Characteristics	Leaves broad, dependent, light, with a few to several marginal hairs and mostly with hairs also at the base. Straw stiff hardly medium long and without hairs at the uppermost node. Panicles light to dark green with long, much dependent branches. Glumes long, broad, white on ripening. Spikelets often three-flowered. Grains long and broad, pure black. Awn long, generally occurring. The hairiness at the base of the grain varies from none to a few medium long to many short hairs. Rachilla smooth. Extremely early, high yielding and resistant to lodging.	
Adaptation	The best variety for northernmost Sweden.	
Use	Fodder.	
Certified ?	Yes.	
Grades recognized ?	Original seed sold only by the General Swedish Seed Ltd., Svalöf. Also other seed on the market. For different qualities see page vii.	
Authority for certification	The State Central Seed Control Station.	
On open market ?	Yes. Also for export.	

Avena sativa :	Oat	Seger (Victory)
Origin	Selection from the old variety Milton.	
Authority	Swedish Seed Association, Svalöf, Sweden.	
Characteristics	Leaves broad, dark green, slightly dependent, without marginal hairs. Hair under and above the uppermost node may be completely lacking ; panicle short, dark green with short, fairly coarse, erect branches ; spikelets often three-flowered ; awn often present ; grain white to brown-white, short and plump ; hairs at the base of the grain completely lacking or few and very short ; rachilla smooth. Good tillering capacity and rather long and not too stiff straw. The variety, still used in southern and central Sweden, has gained world-wide fame due to its reliable yielding capacity, good grain quality and general adaption.	

Adaptation	Southern and central Sweden and other territories with the same climatic conditions.
Use	Fodder.
Certified ?	Yes.
Grades recognized ?	Original seed sold only by the General Swedish Seed Ltd., Svalöf. Also other seed in the market. For different qualities see page vii.
Authority for certification	The State Central Seed Control Station.
On open-market ?	Yes. Also for export.

Avena sativa :	Oat	Sirius II
Origin	Out of the cross Sirius × Engelbrekt II.	
Authority	Swedish Seed Association, Svalöf, Sweden.	
Characteristics	Typical black oat. Leaves blue-green. Straw stiff, the uppermost node hairy underneath on about 50 per cent of the plants. Panicle large, light. The grain black-brown, with a few medium long to long hairs at the base, and with for black-oats exceptionally good quality. Comparatively early.	
Adaptation	In the northern part of the black oat area in central Sweden.	
Use	Fodder.	
Certified ?	Yes.	
Grades recognized ?	Original seed sold only by the General Swedish Seed Ltd., Svalöf. Also other seed on the market. For different qualities see page vii.	
Authority for certification	The State Central Seed Control Station.	
On open market ?	Yes. Also for export.	

Avena sativa :	Oat	Sol II (Sun II)
Origin	Out of the cross Stjärn × Örn.	
Authority	Swedish Seed Association, Västergötland Branch Station, Skara, Sweden.	
Characteristics	Leaves medium broad, deep dark green, erect, without marginal hairs ; straw medium long to short and extremely stiff, panicle fairly large, dense, but a little irregular ; awn rather general, spikelets often three-flowered ; grain large, white, plump. Is at present the Swedish variety with highest yield and stiffest straw.	
Adaptation	Southern and central Sweden and other countries under similar climatic conditions.	
Use	Fodder.	
Certified ?	Yes.	
Grades recognized ?	Original seed sold only by the General Swedish Seed Ltd., Svalöf. Also other seed on the market. For different qualities see page vii.	
Authority for certification	The State Central Seed Control Station.	
On open market ?	Yes. Also for export.	

Avena sativa :	Oat	Stjärn (Star)
Origin	Out of the cross Seger × Kron.	
Authority	Swedish Seed Association, Svalöf, Sweden.	
Characteristics	Leaves comparatively broad, dark green, slightly dependent, without marginal hairs ; only exceptionally a few hairs have been found at the margin just above the hairy leaf-base. At the base one to six hairs occur, although not always on every leaf of the plant. Hair crown under the uppermost node dense, above the same, thin. Panicle comparatively large with dark and erect branches ; the glumes more than medium long, fairly broad and coarse, on ripening white or slightly yellow-white. Spikelets often three-flowered ; awn not generally occurring ; grain white without or with short hairs at the base, plump ; rachilla smooth. Good length straw, moderately resistant to lodging.	

Adaptation	In southern and central Sweden and abroad in territories with similar climatic conditions. Most suitable on light loamy soils, rich in humus.	
Resistance	Rather resistant to grey speck disease.	
Use	Fodder. Also highly appreciated for grits.	
Certified ?	Yes.	
Grades recognized ?	Original seed sold only by the General Swedish Seed Ltd., Svalöf. Also other seed in the market. For different qualities see page vii.	
Authority for certification	The State Central Seed Control Station.	
On open market ?	Yes. Also for export.	
Avena sativa :	Oat	Stormogul II
Origin	Out of the cross Klock II $\times$ Stormogul I.	
Authority	Swedish Seed Association, Ultuna Branch Station, Uppsala, Sweden.	
Characteristics	Leaves narrow, slightly dependent, blue-green, without marginal hairs. Good tillering capacity. Straw very stiff, hair at the uppermost node lacking. Panicle long, branching equally all round with erect branches. Spikelets generally two-flowered. Grain plump, black. The base of the grain mostly with 5 to 8 long to medium long hairs on each side. Rachilla mostly hairy. Awn will generally occur. Rich in straw. Ripening late.	
Adaptation	At the present time the best black-oat variety for central Sweden.	
Resistance	Resistant to grey speck disease.	
Use	Fodder.	
Certified ?	Yes.	
Grades recognized ?	Original seed sold only by the General Swedish Seed Ltd., Svalöf. Also other seed on the market. For different qualities see page vii.	
Authority for certification	The State Central Seed Control Station.	
On open market ?	Yes. Also for export.	

Avena sativa :	Oat	Trio
Origin	Out of the cross (Eho × Argus) × (Drott × Argua).	
Authority	Weibullsholm Plant Breeding Institution, Landskrona, Sweden.	
Characteristics	A white, high-yielding oat. Rather early, stiff straw, very good quality.	
Adaptation	Southern and middle Sweden.	
Use	Fodder.	
Certified ?	Yes.	
Grades recognized ?	Original seed sold only by W. Weibull, Ltd., Also other seed in the market. For different qualities see page vii.	
Authority for certification	The State Central Seed Control Station.	
On open market ?	Yes, also for export.	
Avena sativa :	Oat	Vidar
Origin	Out of the cross Guldregn I × Förädlad Dala.	
Authority	Swedish Seed Association, Västernorrland Branch Station, Lännäs, Sweden.	
Characteristics	Straw not too stiff. Grain large, white, the quality not so good as in later ripening varieties of white oat. Early.	
Adaptation	For those parts of central Sweden where a variety earlier than Guldregn II and Primus is desirable.	
Resistance	Good resistance to grey speck disease.	
Use	Fodder.	
Certified ?	Yes.	
Grades recognized ?	Original seed sold only by the General Swedish Seed Ltd., Svalöf. Also other seed on the market. For different qualities see page vii.	
Authority for certification	The State Central Seed Control Station.	
On open market ?	Yes. Also for export.	

<i>Avena sterilis</i> var. <i>culta</i> :	Oats	Imperial Pusa 1
Origin	Early maturing selection from local Bihar Oat.	
Authority	Bot. Sect., Imp. Agric. Res. Inst., New Delhi, India.	
Characteristics	Stem weak. About 3 to 4.5 ft. tall. Moderate tillering capacity. Long and narrow leaf. Two fertile and one abortive floret in each spikelet. Yellow seed with a greyish tinge on the tips of the glumes. Heavy yielding, but susceptible to lodging. Early maturing.	
Adaptation	Does well on loamy soils over all Northern India at about 24° to 32° N. latitude, with an average annual precipitation of 25 to 50 in. or more.	
Resistance	Fairly resistant to smut and drought. Has not responded to vernalization.	
Use	Plants used for green fodder and/or hay. Grains used as a concentrate for cattle or horses.	
Certified ?	Botanically pure seeds are produced.	
Grades recognized ?	No.	

<i>Avena sterilis</i> var. <i>culta</i> :	Oats	Imperial Pusa 2
Origin	Early maturing selection from local Bihar oat.	
Authority	Bot. Sect., Imp. Agric. Res. Inst., New Delhi, India.	
Characteristics	Stem weak, about 3 to 4.5 ft. tall. Moderate tillering capacity. Long and narrow leaf. Two fertile and one abortive floret in each spikelet. Yellow seed with a greyish tinge on the tips of the glumes. Heavy yielding with weak straw, susceptible to lodging. Early in maturity, but about 10 days later than Imperial Pusa 1.	
Adaptation	Does well on loamy soils in Northern India, at about 24 to 32°N. latitude, with an average annual rainfall of 25-60 in.	
Resistance	Highly resistant to smut and drought.	
Use	Plants used for green fodder and/or hay. Grains used as a concentrate for feeding cattle and horses.	
Certified ?	Botanically pure seeds are produced.	
Grades recognized ?	No.	

Avena sterilis var. *culta* :**Oats****Imperial Pusa Hybrid 3**

Origin	Hybridization between Imperial Pusa 4 and Scotch Potato Oats.
Authority	Bot. Sect., Imp. Agric. Res. Inst., New Delhi, India.
Characteristics	Strong stem with stiff straw. About 4 to 5 ft. tall, profuse tillering. Long and narrow leaf. Two fertile and one abortive floret in each spikelet. Bright yellow, plump seed. Heavy yielding variety with plump and very attractive seeds, does not lodge under ordinary conditions. Midseason variety.
Adaptation	Does well on loamy soils or clay soils in Northern India, at about 24° to 32°N. latitude, with an average annual precipitation of 25 to 60 in. or more.
Resistance	Resistant to smut and drought. Has not responded to vernalization.
Use	Plants used for green fodder and/or hay. Grains used as a concentrate for cattle or horses.
Certified ?	Botanically pure seeds are produced.
Grades recognized ?	No.

Avena sterilis var. *culta* :**Oats****Imperial Pusa hybrid 10**

Origin	Hybridization between Imperial Pusa Hybrid II-308 and Imperial Pusa Hybrid III-242. This is a double cross with the following pedigree :— $\begin{array}{ccc} \text{I.P. 2} \times \text{Scotch Potato Abundance} \times \text{I.P.4.} \\ \\ \text{I.P. hyb. II-303} & \times & \text{I.P. hyb. III-242} \\ & & \\ & \text{I.P. Hybrid 10} \end{array}$
Authority	Bot. Sect., Imp. Agric. Res. Inst., New Delhi, India.
Characteristics	Strong stem with stiff straw. About 4 to 5.5 ft. tall. Fairly good tillering. Long and narrow leaf. Two fertile and one abortive florets. Yellowish white seed, small but very plump. Heavy yielding variety with plump and attractive grains, stiff straw, lodging very seldom. Early maturity.

Avena strigosa × **brevis** : Spring oat, or Brown oat Ceirch Llwyd
Cwta S171

Origin An improved form of *A. strigosa*, known variously as Blewgeirch, Ceirch Llwyd, or Ceirch Teify. Derived from a cross between *A. strigosa* $\times$ *A. brevis*.

Authority Welsh Plant Breeding Station, Wales, Great Britain.

Characteristics Straw abundant, long, fine, becoming fibrous when over-ripe. Panicle open, spikelets 2-grained. Grain dark grey, glabrous, shorter than in *A. strigosa* with much reduced awns on both grains. Distinguishable from *A. strigosa* by its more open head, reduced awns and higher bushel weight. The variety has inherited the hardy, high-tillering, leafy characteristics of *A. strigosa* and the improved grain of *A. brevis*.

Adaptation	For soils of low fertility. High tillering capacity.
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Resistance	Highly resistant to smut.
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Use	For stock feed. Should be cut before crop is completely mature. Can be used as a second straw crop on soil of low average fertility on semi-lowland farms, seed rate 120-140 lb. per acre.
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Certified? Yes.

Grades recognized? Two, Certified A and Certified B.

Authority for
certification

On open market? Yes, first placed on market in 1936.

Beta vulgaris : Mangold Frontenac

Origin	From straight mass selection over 25-30 years. Selected from a commercial stock of Yellow Intermediate.
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Authority Agronomy Department, Macdonald College, McGill Univ., Canada.

Characteristics	Typically intermediate, smooth and reasonably free of pronginess or coarse shoulders. Colour in the below-ground parts a deep orange. Tops medium size. Dry matter content varies from 10-12 lb. per cent. Keeping quality good.
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Adaptation	Adapted to any climate suitable for mangel production where moderately warm and moist conditions prevail. Best for soils not too acid.
Resistance	Based on one season's observation, it possesses considerable resistance to <i>Cercospora</i> leaf spot. Otherwise no special resistance to disease, pests, or drought.
Use	Confined solely to stock-feeding purposes.
Certified ?	Yes.
Grades recognized ?	Registered, certified and commercial. Registered seed traces back to the foundation stock of the variety and at all times possesses a high degree of genuineness and purity. Certified seed is so graded on the basis of a field and seed inspection only. Commercial seed carries no guarantee of genuineness.
Authority for certification	Registered status is given only on the authority of the Canadian Seed Growers' Association while the other two grades are the responsibility of the Plant Products Division.
On open market ?	Yes, seed of all the above grades is available.

Beta vulgaris :	Mangold	Giant White Sugar
Authority	Ralph Moore and Son, Norwich, Ont., Canada.	
Characteristics	Root is typically half-long in type. The skin colour of above-ground portion ranges from lime-green to smoky-grey, that of below-ground parts is white. Flesh is white.	
Adaptation	General.	
Resistance	No marked resistance.	
Use	Stock feed.	
Certified ?	Registered seed is available.	
Grades recognized ?	Official grades of seed recognized on the basis of adaptability of variety, yield, pedigree, purity and germination.	
Authority for certification	The Canadian Seed Growers' Association.	
On open market ?	Yes.	

Beta vulgaris :	Mangold	Prince
Origin	Developed by continuous mass selection from commercial seed secured under the name of Giant White Feeding Half-sugar mangel. Selection carried on for more than 30 years.	
Authority	R. E. Moase, Kensington, Prince Edward Island, Canada.	
Characteristics	This root is typical of the so-called Giant Sugar or White, Half-long sugar mangel. Skin-colour of the above-ground part of the root is pale greenish-white to greyish-green. The skin of the below-ground parts is white. Flesh white. Top growth strong.	
Adaptation	General.	
Resistance	No marked resistance.	
Use	Stock feed.	
Certified ?	Yes, registered seed is grown.	
Grades recognized ?	Official grades of seed recognized on basis of adaptability of variety, yield, pedigree, purity and germination.	
Authority for certification	The Canadian Seed Growers' Association.	
An open market ?	Yes.	

Beta vulgaris :	Mangel	Tip Top
Origin	From commercial stock of Giant Yellow Intermediate mangel by mass selection continuously from 1913 to 1920. This was followed by line breeding and progeny testing on the basis of type, yield, disease resistance and high dry-matter content.	
Authority	The Division of Forage Plants, Central Experimental Farm, Ottawa, Canada.	
Characteristics	Medium to large-sized top. Roots intermediate in type, with tendency to half-long and ovoid types. Side roots often numerous, extending rather high on the side of the root. Under-ground parts a reddish orange, but lighter and darker shades sometimes occur. Dry matter content ranging from 11.0 to 15.8 per cent, with an 8-year-average of 12.96 per cent. Keeping qualities good.	

Adaptation	For all areas suited to the production of mangels.
Resistance	Marked resistance to <i>Cercospora</i> leaf spot at Ottawa.
Use	Chiefly for stock feeding.
Certified ?	Yes, in accordance with the regulations of the Canadian Seed Growers' Association.
Grades recognized ?	Registered, certified and commercial. Registered seed traces back to the foundation stock of the variety, and possesses a high degree of genuineness and purity. Certified seed is so graded on the basis of a field and seed inspection only. Commercial seed carries no guarantee of genuineness.
Authority for certification	Registered status is given only on the authority of the Canadian Seed Growers' Association, while the other two grades are the responsibility of the Plant Products Division.
On open market ?	Yes.
Beta vulgaris : Authority	Mangel Yellow Intermediate (Moore's) Ralph Moore and Son, Norwich, Ont., Canada.
Characteristics	Typically intermediate. The skin colour of above-ground parts is olive-green grading into a smoky-grey. Skin of below-ground parts wax-yellow. Flesh white. Top growth moderate.
Adaptation	General.
Resistance	No marked resistance.
Use	Stock feed.
Certified ?	Yes, registered seed is available.
Grades recognized ?	Yes, on basis of adaptability of variety, pedigree, purity, germination and yielding ability.
Authority for certification	The Canadian Seed Growers' Association.
On open market ?	Yes.

Beta vulgaris :	Mangold Barres	Agrolis
Origin	Selected from Barres Sludstrup.	
Authority	Zwaan en Zoon. Wholesale firm, Voorburg, Holland.	
Characteristics	Rather slender, somewhat tapering. Percentage of dry matter low (± 11). Good yield of dry matter. Very good yield of foliage. Little bolting. Easy to lift. Yellow flesh. Good keeping quality.	
Adaptation	For mild climate.	
Use	Fodder for cattle.	
Certified ?	Yes.	
Grades recognized ?	No.	
Authority for certification	N.A.K. General Netherlands Inspection Service for Seeds of Field Crops.	
On open market ?	Before war available both on the open market and for export. At present probably scarce.	

Beta vulgaris :	Mangold Barres	Barres C.B.
Origin	Selection from trade seed.	
Authority	Central Bureau Farmers' Co-operation, Rotterdam, Holland.	
Characteristics	Slender Barres, low percentage dry matter (± 11) ; rather good dry matter and foliage yield. Very little bolting. Easy to lift. Flesh soft yellow. Slender top. Rather good keeping quality.	

Beta vulgaris :	Mangold	Ceres
Origin	Selected from endemic variety.	
Authority	N.V.J.L. Robertus. Wholesale firm, Winschoten, Holland.	
Characteristics	Tapering white beet with green collar, moderate percentage and good yield of dry matter. Inclined to bolt.	

Adaptation	For mild climate.
Use	Fodder for cattle.
Certified ?	Yes.
Grades recognized ?	No.
Authority for certification	N.A.K. General Netherlands Inspection Service for Seeds of Field Crops.
On open market ?	Before war available both on the open market and for export. At present probably scarce.

Beta vulgaris :	Mangold	Corona
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Origin	Crossbred Endemic beet × Svalöfs Alpha.	
Authority	A. R. Zwaan en Zoon (Wholesale firm), Voorburg, Holland.	
Characteristics	Tapering beet, with plump foot, rising above the soil. Percentage of dry matter low (± 11.5). Yield good. Inclined to bolt. Moderate keeping quality.	
Adaptation	For mild climate.	
Use	Fodder for cattle.	
Certified ?	Yes.	
Grades recognized ?	No.	
Authority for certification	N.A.K. General Netherlands Inspection service for Seeds of Field Crops.	
On open market ?	Before war available both on the open market and for export. At present probably scarce.	

Beta vulgaris :	Mangold	Eureka
Origin	Selection from Collet Vert du Nord.	
Authority	Fa D. J. v. d. Have (Wholesale firm), Kapelle-Biezelinghe, Holland.	
Characteristics	High percentage (± 15) and yield of dry matter. Good yield of foliage. Little bolting. Lifting rather difficult. White flesh, green collar. Good keeping quality.	
Adaptation	For mild climate.	
Use	Fodder for cattle, including horses and pigs.	
Certified ?	Yes.	
Grades recognized ?	No.	
Authority for certification	N.A.K. General Netherlands Inspection Service for Seeds of Field Crops.	
On open market ?	Before war available both on the open market and for export. At present probably scarce.	

Beta vulgaris :	Mangold	Favoriet
Origin	Crossbred-Corona $\times$ trade seed.	
Authority	A. R. Zwaan en Zoon (Wholesale firm), Voorburg, Holland.	
Characteristics	Yield in dry matter good, and percentage rather high (± 13.5). Good yield of foliage. Little bolting. Slender top. White flesh, green collar. Good keeping quality. Rather easy to lift.	
Adaptation	For mild climate.	
Use	Fodder for cattle, including horses and pigs.	
Certified ?	Yes.	
Grades recognized ?	No.	
Authority for certification	N.A.K. General Netherlands Inspection Service for Seeds of Field Crops.	
On open market ?	Before war available both on the open market and for export. At present probably scarce.	

Beta vulgaris :	Half-sugar beet	Frisco
Origin	Selected from trade seed.	
Authority	Zwaan en de Wiljes N.V. (Wholesale firm), Scheemda, Holland.	
Characteristics	Very high percentage (± 21) and high yield of dry matter. High yield of persistent green foliage. Little bolting. Difficult to lift, rather much adherence of soil. White flesh, good keeping quality.	
Adaptation	Adapted for mild climate.	
Use	Fodder for cattle.	
Certified ?	Yes.	
Grades recognized ?	No.	
Authority for certification	N.A.K. General Netherlands Inspection Service for Seeds of Field Crops.	
On open market ?	Before war available both on the open market and for export. At present probably scarce.	
Beta vulgaris :	Mangold	Groeningia
Origin	Selected from endemic variety.	
Authority	Zwaan en de Wiljes N.V. (Wholesale firm), Scheemda, Holland.	
Characteristics	Tapering, dry matter yield 15 per cent. Average yield of foliage. Rapid growth. Very little bolting. Lifting rather difficult. Slender top. Good keeping quality.	
Adaptation	For mild climate.	
Use	Fodder for cattle, including horses and pigs.	
Certified ?	Yes.	
Grades recognized ?	No.	
Authority for certification	N.A.K. General Netherlands Inspection Service for Seeds of Field Crops.	
On open market ?	Before war available both on the open market and for export. At present probably scarce.	

Beta vulgaris :	Mangold	Groenkraag CB
Origin	Selected from trade seed.	
Authority	Farmers' Co-operation, Central Bureau, Rotterdam, Holland.	
Characteristics	Rather high percentage (± 14.5) and very high yield of dry matter. Rather high yield of persistent foliage. Little bolting. Lifting rather difficult. White flesh, green collar. Good keeping quality.	
Adaptation	For mild climate.	
Use	Fodder for cattle, including horses and pigs.	
Certified ?	Yes.	
Grades recognized ?	No.	
Authority for certification	N.A.K. General Netherlands Inspection Service for Seeds of Field Crops.	
On open market ?	Before war available both on the open market and for export. At present probably scarce.	
Beta vulgaris :	Mangold	Hollandia
Origin	Selected from trade seed.	
Authority	N. V. Beta (Wholesale firm), Winschoten, Holland.	
Characteristics	Rather high, somewhat irregular percentage of dry matter (± 14). High yield of dry matter and foliage. Somewhat inclined to bolting. Rather difficult to lift. White flesh, green collar.	
Adaptation	For mild climate.	
Use	Fodder for cattle, including horses and pigs.	
Certified ?	Yes.	
Grades recognized ?	No.	
Authority for certification	N.A.K. General Netherlands Inspection Service for Seeds of Field Crops.	
On open market ?	Before war available both on the open market and for export. At present probably scarce.	

Beta vulgaris :	Mangold	Ovana
Origin	Crossbred half sugar beet × Rheinischer Lanker.	
Authority	N. V. J. Joordens, Wholesale firm, Venlo-Blerick, Holland.	
Characteristics	Short, bulky, well-shaped, easy to lift, rather high percentage dry matter (± 13.5) and yield. High yield of rapid-growing and persistent foliage. Inclination to bolt. White fresh, green collar. Good keeping quality.	
Adaptation	For mild climate.	
Use	Fodder for cattle, including horses and pigs.	
Certified ?	Yes.	
Grades recognized ?	No.	
Authority for certification	N.A.K. General Netherlands Inspection Service for Seeds of Field Crops.	
On open market ?	Before war available both on the open market and for export. At present probably scarce.	
Beta vulgaris :	Mangold Barres	Productiva
Origin	Selection from Barres Ferrisler.	
Authority	N. V. Zwaan en de Wiljes (Wholesale firm), Scheemda, Holland.	
Characteristics	Mangold Barres, with yellow flesh and bronze collar. Good yield of dry matter and foliage, low percentage of dry matter (± 11). Little bolting. Easy to lift, moderate keeping quality.	
Adaptation	For mild climate.	
Use	Fodder for cattle.	
Certified ?	Yes.	
Grades recognized ?	No.	
Authority for certification	N.A.K. General Netherlands Inspection Service for Seeds of Field Crops.	
On open market ?	Before war available both on the open market and for export. At present probably scarce.	

Beta vulgaris :	Half-sugar beet	Voedersuikerbiet CB
Origin	Selected from endemic variety.	
Authority	Farmers' Co-operation, Central Bureau, Rotterdam, Holland.	
Characteristics	Very high, sometimes irregular percentage of dry matter (± 19). High yield of dry matter and of persistent foliage. Little bolting. Lifting difficult ; rather much adherence of soil. Flesh white ; good keeping quality.	
Adaptation	For mild climate.	
Use	Fodder for cattle.	
Certified ?	Yes.	
Grades recognized ?	No.	
Authority for certification	N.A.K. General Netherlands Inspection Service for Seeds of Field Crops.	
On open market ?	Before war available both on the open market and for export. At present probably scarce.	

Beta vulgaris :	Fodder sugar beet	Bacon, strain 23
Origin	Selection in Svalöf's Rubra.	
Authority	Weibullsholm Plant Breeding Institute, Landskrona, Sweden.	
Characteristics	Root shape conical, colour pink. Percentage of dry matter about 14.	
Adaptation	All good soils in Europe.	
Use	Fodder.	
Certified ?	Yes.	
Grades recognized ?	Original seed sold by W. Weibull Ltd. For different qualities see page vii.	
Authority for certification	The State Central Seed Control Station.	
On open market ?	Yes, also for export.	

Beta vulgaris :	Mangel	Barres Halvlång
Origin	Selection in Danish material.	
Authority	Swedish Seed Association, Svalöf, Sweden.	
Characteristics	Roots vary in shape and colour. Most are medium long, rather bulky towards the tip, but some are long, rather thick and cylindrical. Colour varies from light orange yellow to dark red yellow. Tops rather luxuriant but not uniform. Laminae mostly large, more or less broad oval, slightly knobbed. Petioles mostly long, rather thick but narrow, white to white green with green streaks.	
Adaptation	In Sweden up to 60°N. lat.	
Use	Fodder.	
Certified ?	Yes.	
Grades recognized ?	Original seed sold by the General Swedish Seed Ltd. For different qualities see page vii.	
Authority for certification	The State Central Seed Control Station.	
On open market ?	Yes, also for export.	
Beta vulgaris :	Mangel	Globus
Origin	Selection from the English strain Perfection.	
Authority	Otto J. Olson and Son Ltd., Hammenhög, Sweden.	
Characteristics	" Barres " -coloured, mostly globular, but with some more cylindric roots. Tops small. High root yield but rather low percentage of dry matter.	
Adaptation	Recommended in mangel-districts where harvesting is to be mechanized.	
Use	Fodder.	
Certified ?	Yes.	
Grades recognized ?	Original seed sold only by Otto J. Olson and Son Ltd. For different qualities see page vii.	
Authority for certification	The State Central Seed Control Station.	
On open market ?	Yes, also for export.	

Beta vulgaris :	Fodder sugar beet	Gullåkerbeta
Origin	Crosses between fodder beet and sugar beet.	
Authority	Otto J. Olson and Son Ltd., Hammenhög, Sweden.	
Characteristics	Root white, green above ground, medium long, intermediate in shape with rather long tap root. Tops very large. The percentage of dry matter very high, about 20.	
Adaptation	All districts where cultivation of mangels is remunerative.	
Use	Fodder.	
Certified ?	Yes.	
Grades recognized ?	Original seed sold only by Otto J. Olson and Son Ltd. For different qualities see page vii.	
Authority for certification	The State Central Seed Control Station.	
On open market ?	Yes, also for export.	
Beta vulgaris :	Mangel	Hammenhögs Original Barres
Origin	Crosses between two samples of beet seed from Denmark named Strynø V and Ferritslev V.	
Authority	Otto J. Olson and Son Ltd., Hammenhög, Sweden.	
Characteristics	Dark " Barres " coloured with some lighter roots. Medium long, bulky root shape. Tops medium large. Percentage dry matter about 11.5.	
Adaptation	All districts where cultivation of mangels is remunerative.	
Use	Fodder.	
Certified ?	Yes.	
Grades recognized ?	Original seed sold only by Otto J. Olson and Son Ltd. For different qualities see page vii.	
Authority for certification	The State Central Seed Control Station.	
On open market ?	Yes, also for export.	

Beta vulgaris :	Fodder sugar beet	Hammenhögs Original Ljusröd Fodersockerbeta
Origin	Selection from the Danish strain Marienlyst V.	
Authority	Otto J. Olson and Son, Ltd., Hammenhög, Sweden.	
Characteristics	Colour mostly light red but with a few white, green-topped roots. Rather short and bulky. Tops comparatively small. The percentage of dry matter about 14-14.5.	
Adaptation	All districts where cultivating of mangels is remunerative.	
Use	Fodder.	
Certified ?	Yes.	
Grades recognized ?	Original seed sold only by Otto J. Olson and Son Ltd. For different qualities see page vii.	
Authority for certification	The State Central Seed Control Station.	
On open market ?	Yes, also for export.	
Beta vulgaris :	Mangel	Hammenhögs Original Röd Eckendorfer
Origin	Selection in a Danish sample from Erhard Fredericksen's strain of Eckendorfer.	
Authority	Otto J. Olson and Son Ltd., Hammenhög, Sweden.	
Characteristics	Root medium long, cylindrical to hour-glass-shaped. Tops comparatively small. The root yield very high but the percentage of dry matter rather low, about 10-10.5.	
Adaptation	All districts where cultivation of mangels is remunerative.	
Use	Fodder.	
Certified ?	Yes.	
Grades recognized ?	Original seed sold only by Otto J. Olson and Son Ltd. For different qualities see page vii.	
Authority for certification	The State Central Seed Control Station.	
On open market ?	Yes, also for export.	

Beta vulgaris : **Fodder sugar beet** **Milka**

Origin Selection from material obtained by crossing Barres strain 150 (from Barres Strynö V) and sugar beet Tyftofte VII.

Authority Algot Holmberg and Söner Ltd., Norrköping, Sweden.

Characteristics Root shape bulky, colour white, green above ground. Rather high yield and very high percentage of dry matter. Very large tops.

Adaptation Southern and middle Sweden.

Use Fodder.

Certified ? Yes.

Grades recognized ? Original seed sold by Algot Holmberg and Sons Ltd. For different qualities see page vii.

Authority for certification The State Central Seed Control Station.

On open market ? Yes, for export if available.

Beta vulgaris : **Fodder sugar beet** **Monark**

Origin Milka $\times$ sugar beet.

Authority Algot Holmberg and Sons Ltd., Norrköping, Sweden.

Characteristics Root not quite as bulky towards tip as in Svea-Rex and Milka, growing deeper in the ground, but it is smooth and without the deep indentations common in sugar beets. Colour white, green above ground. The total yield a little less than that of the two above-mentioned strains, but the yield of dry matter is higher. Very large tops.

Adaptation	Southern and middle Sweden.	
Use	Fodder.	
Certified ?	Yes.	
Grades recognized ?	Original seed sold only by Algot Holmberg and Sons Ltd. For different qualities see page vii.	
Authority for certification	The State Central Seed Control Station.	
On open market ?	Yes, for export if available.	
Beta vulgaris :	Fodder sugar beet	Nova
Origin	Alfa × Barres Strynö V.	
Authority	The Swedish Seed Association, Svalöf, Sweden.	
Characteristics	Percentage of dry matter about 14. Large, rather bulky, oval to rather long roots, colour white with green top. About half the roots grow above ground. Large, dark green tops. The lamina short and broad oval, with large knobs. The leaf-stalks broad, rather thick, white green.	
Adaptation	In Sweden up to 60° N. lat.	
Use	Fodder.	
Certified ?	Yes.	
Grades recognized ?	Original seed sold by the General Swedish Seed Ltd. For different qualities see page vii.	
Authority for certification	The State Central Seed Control Station.	
On open market ?	Yes, also for export.	

Beta vulgaris :	Fodder sugar beet	Regina, strain 27
Origin	Slättbo Barres × Sugar beet.	
Authority	Weibullsholm Plant Breeding Institute, Landskrona, Sweden.	
Characteristics	Root shape short, pointed oval. Colour yellow. Percentage of dry matter about 15.	
Adaptation	All good soils in Europe.	
Use	Fodder.	
Certified ?	Yes.	
Grades recognized ?	Original seed sold by W. Weibull Ltd. For different qualities see page vii.	
Authority for certification	The State Central Seed Control Station.	
On open market ?	Yes, also for export.	

Beta vulgaris :	Fodder sugar beet	Röd Kägla
Origin	Röd Oberndorfer × Sugar beet.	
Authority	Swedish Seed Association, Svalöf, Sweden.	
Characteristics	Percentage of dry matter about 17. The roots are short, conical to globular. The colour as a rule red, but also a few white roots. Tops rather low. Lamina rather smooth, medium large. The petioles towards the bases red streaked.	
Adaptation	In Sweden up to 60°N. lat.	
Use	Fodder.	
Certified ?	Yes.	
Grades recognized ?	Original seed sold by the General Swedish Seed Ltd. For different qualities see page vii.	
Authority for certification	The State Central Seed Control Station.	
On open market ?	Yes, also for export.	

Beta vulgaris :	Fodder sugar beet	Rubra II
Origin	Selection in a pedigree (167/15) from Svalöf's Rubra (imported from Vilmorin, France) crossed with other Rubra pedigrees.	
Authority	Swedish Seed Association, Svalöf. Sweden.	
Characteristics	Percentage of dry matter about 14-15. The roots of varying length, more or less bulky towards the tip, growing to the half or the third of their length above ground, pink coloured. The tops not too high but rather luxuriant. Lamina rather thick, broad oval, flat to slightly knobbed. The petioles with varying length, rather thick, narrow to broad groove shaped, white yellow, towards their bases often slightly pink streaked.	
Adaptation	In Sweden up to 60°N. lat.	
Use	Fodder.	
Certified ?	Yes.	
Grades recognized ?	Original seed sold by the General Swedish Seed Ltd. For different qualities see page vii.	
Authority for certification	The State Central Seed Control Station.	
On open market ?	Yes, also for export.	

Beta vulgaris :	Fodder sugar beet	Särinmer, strain 37
Origin	Slättbo-Barres × older strain of Särinmer.	
Authority	Weibullsholm Plant Breeding Institute, Landskrona, Sweden.	
Characteristics	Root shape long oval, colour white, green above ground. Percentage of dry matter about 17.	
Adaptation	All good soils in Europe.	
Use	Fodder.	
Certified ?	Yes.	
Grades recognized ?	Original seed sold by W. Weibull Ltd. For different qualities see page vii.	
Authority for certification	The State Central Seed Control Station.	
On open market ?	Yes, also for export.	

Beta vulgaris : **Mangel** **Slättbo Barres II, strain 18**

Origin	Selection in older Slättbo Barres.
Authority	Weibullsholm Plant Breeding Institute, Landskrona, Sweden.
Characteristics	Root rather long, oval, bulky, red Barres-colour, percentage of dry matter about 12.
Adaptation	All good soils in Europe.
Use	Fodder.
Certified ?	Yes.
Grades recognized ?	Original seed sold by W. Weibull Ltd. For different qualities see page vii.
Authority for certification	The State Central Seed Control Station.
On open market ?	Yes, also for export.

Beta vulgaris : **Mangel** **Svalöfs röd Eckendorfer**

Origin	Selection in a German strain of Eckendorfer.
Authority	Swedish Seed Association, Svalöf, Sweden.
Characteristics	Percentage of dry matter about 11. Roots short, thick, cylindric, red. Rather small tops. Lamina small. Petioles narrow with red streaks.
Adaptation	In Sweden up to 60° N. lat.
Use	Fodder.
Certified ?	Yes.
Grades recognized ?	Original seed sold by the General Swedish Seed Ltd. For different qualities see page vii.
Authority for certification	The State Central Seed Control Station.
On open market ?	Yes, also for export.

Beta vulgaris :	Mangel	Svea Barres
Origin	Selection in the Danish Barres Pajbjerg VII.	
Authority	Algot Holmberg and Sons Ltd., Norrköping, Sweden.	
Characteristics	Root of Barres shape, colour straw-yellow. Tops rather large. The percentage of dry matter medium high.	
Adaptation	Southern and Middle Sweden.	
Use	Fodder.	
Certified ?	Yes.	
Grades recognized ?	Original seed sold only by Algot Holmberg and Sons Ltd. For different qualities see page vii.	
Authority for certification	The State Central Seed Control Station.	
On open market ?	Yes, for export if available.	

Beta vulgaris :	Fodder sugar beet	Svea-Rex
Origin	Selection in crosses between Barres strain 150 (from Barres Strynö V) and sugar beet Tyftofte VII.	
Authority	Algot Holmberg and Sons Ltd., Norrköping, Sweden.	
Characteristics	The root has Barres shape, colour light straw-yellow. Large tops. High yield and high percentage of dry matter.	
Adaptation	Southern and Middle Sweden.	
Use	Fodder.	
Certified ?	Yes.	
Grades recognized ?	Original seed sold only by Algot Holmberg and Sons Ltd. For different qualities see page vii.	
Authority for certification	The State Central Seed Control Station.	
On open market ?	Yes, for export if available.	

Beta vulgaris :	Mangel	Weibulls Cylinder Barres, Strain 18
Origin	Selection in older Slättbo Barres.	
Authority	Weibullsholm Plant Breeding Institute, Landskrona, Sweden.	
Characteristics	Root oval bulky. Red Barres colour. Percentage of dry matter about 12.	
Adaptation	All good soils in Europe.	
Use	Fodder.	
Certified ?	Yes.	
Grades recognized ?	Original seed sold by W. Weibull Ltd. For different qualities see page vii.	
Authority for certification	The State Central Seed Control Station.	
On open market ?	Yes, also for export.	

Beta vulgaris :	Mangel	Weibulls gul Eckendorfer, Strain 13
Origin	Selection in Barres Eckendorfer.	
Authority	Weibullsholm Plant Breeding Institute, Landskrona, Sweden.	
Characteristics	Root shape cylindric, colour yellow, percentage of dry matter about 11.	
Adaptation	All good soils in Europe.	
Use	Fodder.	
Certified ?	Yes.	
Grades recognized ?	Original seed sold by W. Weibull Ltd. For different qualities see page vii.	
Authority for certification	The State Central Seed Control Station.	
On open market ?	Yes, also for export.	

Beta vulgaris :	Mangel	Weibulls Röd Eckendorfer, Strain 11
Origin	Selection in Barres Eckendorfer.	
Authority	Weibullsholm Plant Breeding Institute, Landskrona, Sweden.	
Characteristics	Root shape cylindric, colour dark red; percentage of dry matter about 11.	
Adaptation	All good soils in Europe.	
Use	Fodder.	
Certified ?	Yes.	
Grades recognized ?	Original seed sold by W. Weibull Ltd. For different qualities see page vii.	
Authority for certification	The State Central Seed Control Station.	
On open market ?	Yes, also for export.	

Brachiaria brizantha : **CPI 5632 (grown in Trinidad)**

Authority	A. McTaggart, Division Plant Industry, Fitzroyvale, Queensland.	
Characteristics	Produces a dense leafy grass cover of nutritious forage: propagated by root division: seeds are sterile owing to chromosomal hybridity.	
Use	Perennial forage for grazing or soiling in Trinidad.	

Brachiaria decumbens : **CPI 1694 (grown in Trinidad)**

Authority	A. McTaggart, Division Plant Industry, Fitzroyvale, Queensland.	
Characteristics	Similar to <i>B. brizantha</i> , but a more vigorous grower.	
Use	Perennial forage for grazing or soiling in Trinidad.	

Brachiaria dictyonera : **Sheep grass** **CPI 2002 (grown in Trinidad)**

Authority A. McTaggart, Division Plant Industry, Fitzroyvale, Queensland.

Characteristics The nearest approach to a pasture grass : drought resistant, but not an effective smother for weeds : seed sterile.

Use Perennial pasture grass in Trinidad.

Brassica campestris : **Swede, rutabaga** **Wilhelmsburger Nappan 1935**

Origin Selection out of Wilhelmsburger Hartman (1935) mainly on the basis of resistance to club root *Plasmodiophora brassicae*.

Authority Division of Forage Crops, Dominion Experimental Farm, Nappan, N.S., Canada.

Characteristics Top is medium to large. Leaves glaucous, green, often with reddish tinges at the margins. Petioles mostly green. Neck is of medium length and thickness.

The highest percentage of roots are true globe in type, although some may be called flat globes. Skin colour above-ground is green. The flesh is yellow, being often lighter yellow than most varieties, commonly grown. Flesh is medium coarse. A very small percentage of bronze topped rogues appear in Wilhelmsburger. In addition there are from 5 to 15 per cent of roots off type from a true globe, being variates of flat, ovoid and tankard.

Resistance Highly resistant to club root at the Dominion Experimental Farm, Nappan, N.S., and surrounding area.

Use	In general quality is highly satisfactory for table use It compares favourably with the better varieties in dry matter content, averaging 9.7 per cent over a period of years.
Certified ?	Yes.
Grades recognized ?	Yes ; on basis of genetic constitution, weed seeds, disease germination and general appearance.
Authority for certification	Canadian Seed Growers' Association and Dominion Department of Agriculture.

Brassica napus :	Rape	(a) Giant. (b) Broad Leaf Essex I. (c) Broad Leaf Essex II.
Origin	(a) <i>Giant</i>: developed by selection from within hybrid progenies obtained by crossing selections from inbred families derived from two lines, one of English and one of French origin. (b) <i>Broad Leaf Essex I</i>: developed by selection from within hybrid progenies obtained by crossing selections from inbred families derived from lines of Dutch origin. (c) <i>Broad Leaf Essex II</i>: developed by selection from within hybrid progenies obtained from the cross (Giant $\times$ Broad Leaf Essex I) $\times$ Broad Leaf Essex I.	
Authority	(a) and (b): J. W. Hadfield and R. A. Calder. (c) R. A. Calder, New Zealand.	
Characteristics	(a) A tall-growing form with high initial yield and a fair recovery after the first cut; subsequent recoveries generally poor. Leaves large, broad and medium green. The foliage not dense and as plant matures tends to produce a definite central woody stem. In comparison with (b), it gives higher initial yield of forage and greater yield of dry matter per acre. Is more succulent and therefore more palatable. Later maturing type than (b); under damp conditions tends not to ripen and lambs will not then fatten readily when grazed on it; recommended, therefore, for drier areas than those localities in which summer wet weather might be experienced. (b) Relatively short-growing form with a lower initial yield than Giant, but better recovery. Dark bluish-green leaves smaller and, in the young stage, more pubescent than those of the Giant type. Foliage dense with comparatively little central stalk development. Ripens more readily than the Giant type and is preferred where continued wet weather is experienced during the growing period; is also the more satisfactory type if required for winter or early spring grazing. (c) Intermediate in type between Giant and Broad Leaf Essex I, but verging more towards the latter. Taller and more productive than (b) but not as dense. Leaves intermediate between Giant and Broad Leaf Essex I in regard to dry matter content and could be grown in districts suited either for (a) or (b).	
Adaptation	Rape is suited more for temperate latitudes but within such regions possesses wide adaptability to varying conditions of soil and climate. Will grow on a fairly extensive range of soil types from rich	

loam to heavy clays but prefers a rich, friable, well-drained soil, liberally supplied with organic matter. Develops best under cool and humid conditions, but in a wet sunless season tends to grow rank and will not ripen, in which case, on feeding, dietetic troubles arise and stock will not fatten ; this applies more particularly to the Giant type. Under dry conditions growth is generally restricted but in these circumstances the crop usually has good fattening properties.

Resistance	All types susceptible to club root (<i>Plasmodiophora brassicae</i>) and to attack by aphids (<i>Brevicoryne brassicae</i>), diamond-back moth (<i>Plutella maculipennis</i>) and white butterfly (<i>Pieris rapae</i>).
Use	Used most extensively on mixed cropping farms for fattening store lambs and is important in the preparation of land for wheat ; also a good forage crop for pigs and for cattle but is apt to taint milk.
Officially certified ?	Both (a) and (b) types have been grown under certification since 1935 and have been distributed as Government Certified Giant Rape and Government Certified Broad leaf Essex Rape. (c) is at present being increased under certification but has not yet been distributed ; on its introduction into commerce the numerals I and II are to be used to distinguish the two Broad Leaf Essex types.
Grades recognized ?	No.
Authority for certification	Fields Division, Department of Agriculture, New Zealand.
On open market ?	Sufficient supplies of both (a) and (b) are grown annually to meet local demands, but the export of any surplus is dependent on economic consideration. Supplies of (c) should be available for local use after the 1944/45 harvest.

Brassica napus :	Rape	Japan Rape—Japani Sarson
Authority	Fodder Specialist, Government of Punjab, India.	
Characteristics	Closely resembles turnip in vegetative above-ground parts. The leaves may be 1.5 ft. in length and 6 to 9 in. in breadth. Leaves are numerous, light green, and spring from the top of the root in a rosette. Stalks are fleshy and may be 4 to 6 ft. Flowers yellowish. Pods are pale yellow when ripe. Seeds are roundish, purplish brown.	
Adaptation	Grows throughout the Province under irrigated and non-irrigated conditions. Usually cultivated in light loam soils but grows on all types. Sown from end of September to end of November.	
Resistance	Often attacked by aphids and fungous disease, e.g. <i>Cystopus candidus</i> and mildew.	
Use	Fed green and is specially useful in unirrigated tracts. The seed is used for oil extraction and the cake is used for feeding cattle, and as manure.	
Certified ?	Yes.	
Grades recognized ?	No.	
Authority for certification	Department of Agriculture, Punjab.	

Brassica napus var. napobrassica :	Swede	Acadia
Origin	Developed from a commercial strain of the Bangholm variety by a process of mass selection since 1914. Basis of selection was high yield, type and colour.	
Authority	The Division of Forage Plants, Central Experimental Farm, Ottawa, Canada.	
Characteristics	Top growth is large and leaves are held high. Neck is relatively thick and medium in length. Roots are globe in type with varieties of the ovoid and tankard sometimes occurring. Quarter-cracks frequently occur, giving the root a coarse appearance. Skin colour above ground is purple, but an occasional bronze-topped root occurs. Flesh is yellow and medium to coarse in texture. Cooking quality is excellent. Percentage of dry matter is relatively high. Yielding capacity and keeping qualities good.	

Adaptation	Adapted to all areas suited to the production of swedes.
Resistance	No definite evidence of disease resistance observed.
Use	Being characterized by high yield and satisfactory keeping qualities, mainly used for stock feeding. Its use for table stock is limited, due to relatively rough appearance.
Certified ?	Yes, in accordance with the regulations of the Canadian Seed Growers' Association.
Grades recognized ?	Three grades of seed are officially recognized—registered, certified and commercial. Registered seed traces back to the foundation stock of the variety, and at all times possesses a high degree of genuineness and purity. Certified seed is so graded on the basis of a field and seed inspection only. Commercial seed carries no guarantee of genuineness.
Authority for certification	Registered status is given only on the authority of the Canadian Seed Growers' Association, while the other two grades are the responsibility of the Plant Products Division.
On open market ?	Yes.

Brassica napus var. napobrassica :	Swede	Ditmars Bronze Top
Origin	Developed by continuous mass selection over more than 20 years from an old commercial stock. Selection on the basis of root type and colour.	
Authority	R. V. Ditmar and Son, Deep Brook, N.S., Canada.	
Characteristics	Root is globe-shaped and large, and smooth. Above-ground portion ranges from bright green to bronze. Flesh is yellow, fine to medium in texture and of good flavour.	
Adaptation	Especially adapted to maritime areas in Canada, but also grows well in the interior.	
Resistance	Not particularly resistant to disease or drought.	
Use	Stock feed and for table purposes.	
Certified ?	Yes, registered seed is available.	
Grades recognized ?	Yes, on basis of adaptability of variety, yield, pedigree, purity and germination.	
Authority for certification	The Canadian Seed Growers' Association.	
On open market ?	Yes.	

Brassica napus var. napobrassica :	Swede	Laurentian
Origin	Developed from a variety Bangholm obtained through commercial channels. The breeding method employed involved a combination of inbreeding and mass selection. Following a single selfing in 1912 the strain resulting—Bangholm 8112—was mass selected until 1922 when three successive selfings were again employed. The result of this inbreeding was the Laurentian variety which since then has been maintained, without obvious change, by a process of mass selection.	
Authority	A product of breeding and selection in the Agronomy Department, Macdonald College, McGill Univ., Quebec, Canada.	
Characteristics	In type, is just slightly longer than a true globe and exceedingly uniform in shape and smoothness. The skin in the above-ground parts, under normal growing conditions, is an intense purple. Flesh is a very	

light pink and of a fine and even grain. The root system is small—entirely devoid of coarseness and pronginess. The shoulder is very smooth, neck largely absent and the tops notably smaller than in most other sorts.

Adaptation	Adapted to a cool and moist climate. Good loam soils preferred and a high level of fertility, particularly in view of the relatively small root system.
Resistance	No very positive evidence of resistance. Compared with other commercial sorts, however, it is somewhat resistant to soft rot (<i>Bacillus carotovorus</i>). Average susceptibility to black rot (<i>Pseudomonas campestris</i>) and club root, finger and toe (<i>Plasmodiophora brassicae</i>).
Use	For stock feeding and for table. Its extreme smoothness and uniformity have popularized this variety as a product for human consumption to a point where few other sorts are now grown in the several localities in Canada where table-stock is produced.
Certified ?	Yes.
Grades recognized ?	Three grades of seed are recognized, viz., registered, certified and commercial. Registered seed traces back to the foundation stock of the variety and at all time possesses a high degree of genuineness and purity. Certified seed is so graded on the basis of a field and seed inspection only. Commercial seed carries no guarantee of genuineness.
Authority for certification	Registered status is given only on the authority of the Canadian Seed Growers' Association, while the other two grades are the responsibility of the Plant Products Division.
On open market ?	Seed, particularly of the registered status, is available in considerable quantity on the open market and for export.

Brassica napus napobrassica :	Swede	Tammisto
Origin	Bred from the Finnish variety Mustiala.	
Authority	Plant Breeding Station, Tammisto, Finland.	
Characteristics	Red-hulled, flat, very even. Does not build a neck, not woody. Percentage of dry matter high. Rather early.	
Adaptation	Cultivated in South and Middle Finland.	
Use	A first-class culinary swede, and its productiveness makes it suited for cultivation as fodder.	
On open market ?	Yes.	

Brassica napus ssp. napobrassica :	Swede	Balder, strain 99
Origin	Drottning × Trondhjem.	
Authority	Weibullsholm Plant Breeding Institute, Landskrona, Sweden.	
Characteristics	Root shape globular to oval. Light bronze coloured. Percentage of dry matter about 11.	
Adaptation	All good soils in Europe.	
Use	Fodder.	
Certified ?	Yes.	
Grades recognized ?	Original seed sold by W. Weibull Ltd. For different qualities see page vii.	
Authority for certification	The State Central Seed Control Station.	
On open market ?	Yes, also for export.	

Brassica napus ssp. napobrassica :	Swede	Drottning, strain 38
Origin	From Sutton's Queen.	
Authority	Weibullsholm Plant Breeding Institute, Landskrona, Sweden.	
Characteristics	Root shape globular. Bronze coloured above ground. Percentage of dry matter about 11.	

Adaptation	Good soils in Europe.
Use	Fodder.
Certified ?	Yes.
Grades recognized ?	Original seed sold by W. Weibull Ltd. For different qualities see page vii.
Authority for certification	The State Central Seed Control Station.
On open market ?	Yes, also for export.

Brassica napus ssp. napobrassica : **Swede** **Göta**
Origin Selection in old strains of Swedes, cultivated in
Östergötland.

Authority	Algot Holmberg and Sons Ltd., Norrköping, Sweden.
Characteristics	The root round to flat round with thin root tip. Yellow, green above ground, the tops medium large, light green.
Adaptation	Middle and northern Sweden.
Resistance	Comparatively resistant to slime fungus (<i>Plas- modiophora brassicae</i>).
Use	Fodder.
Certified ?	Yes.
Grades recognized ?	Original seed sold only by Algot Holmberg and Sons Ltd. For different qualities see page vii.
Authority for certification	The State Central Seed Control Station.
On open market ?	Yes, for export if available.

Brassica napus ssp. napobrassica :		Swede	Gullåker II
Origin	Crossing between Gullåker I (selection in Göta) and Bangholm.		
Authority	Otto J. Olson and Son Ltd., Hammenhög, Sweden.		
Characteristics	Roots light, green above ground, shape flat to globular, tops medium large. Very high yield, percentage of dry matter about 10-10.5.		
Adaptation	As far north as southern Norrland.		
Use	Fodder.		
Certified ?	Yes.		
Grades recognized ?	Original seed sold only by Otto J. Olson and Son Ltd. For different qualities see page vii.		
Authority for certification	The State Central Seed Control Station.		
On open market ?	Yes, also for export.		

Brassica napus ssp. napobrassica :		Swede	Hammenhögs Original Bangholm
Origin	Selection in the Danish strain Pajbjerg V.		
Authority	Otto J. Olson and Son Ltd., Hammenhög, Sweden.		
Characteristics	Roots red-violet in colour, mostly oval but with a few intermediate or flat roots. Tops medium large. Percentage of dry matter 11.5-12.		
Adaptation	As far north as southern Norrland.		
Use	Fodder.		
Certified ?	Yes.		
Grades recognized ?	Original seed sold only by Otto J. Olson and Son Ltd. For different qualities see page vii.		
Authority for certification	The State Central Seed Control Station.		
On open market ?	Yes, also for export.		

Brassica napus ssp. napobrassica :	Swede	Kungs Bangholm
Origin	Selection in the Danish strain Bangholm Pajbjerg V.	
Authority	Algot Holmberg and Sons Ltd., Norrköping, Sweden.	
Characteristics	The root oval to globular, dark red in colour. Large tops.	
Adaptation	Middle and Northern Sweden.	
Resistance	Rather highly resistant to mildew and some resistance to slime fungus.	
Use	Fodder.	
Certified ?	Yes.	
Grades recognized ?	Original seed sold only by Algot Holmberg and Sons Ltd. For different qualities see page vii.	
Authority for certification	The State Central Seed Control Station.	
On open market ?	Yes, for export if available.	
Brassica napus ssp. napobrassica :	Swede	Östgöta II, strain 3
Origin	From Göta.	
Authority	Weibullsholm Plant Breeding Institute, Landskrona, Sweden.	
Characteristics	Root shape flat, globular. Colour white with green top. Percentage of dry matter about 10.	
Adaptation	On good soils in Europe.	
Resistance	Rather resistant to slime fungus (<i>Plasmodiophora brassicae</i>).	
Use	Fodder.	
Certified ?	Yes.	
Grades recognized ?	Original seed sold by W. Weibull Ltd. For different qualities see page vii.	
Authority for certification	The State Central Seed Control Station.	
On open market ?	Yes, also for export.	

Brassica napus ssp. napobrassica :	Swedes	Svalöfs Bangholm
Origin	Selection in Danish Bangholm, Olagaard V.	

Authority	Swedish Seed Association, Svalöf, Sweden.
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Characteristics	Percentage of dry matter about 12. Roots very smooth, globular to short cylindric. Yellow-fleshed, grey-violet topped. Tops high and luxuriant. Laminae mostly have large top lobes and few, rather narrow side lobes.
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Adaptation	In Sweden to 62° N. latitude.
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Use	Fodder.
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Certified ?	Yes.
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Grades recognized ?	Original seed sold only by the General Swedish Seed Ltd. For different qualities see page vii.
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Authority for certification	The State Central Seed Control Station.
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On open market ?	Yes, also for export.
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Brassica napus ssp. napobrassica :	Swedes	Svalöfs Gul Svensk
Origin	Selection in old Swedish strains.	

Authority	Swedish Seed Association, Sweden.
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Characteristics	Percentage of dry matter about 12. Roots yellow-fleshed and green-topped mostly globular. Tops high and luxuriant. Laminae mostly either narrow with long top lobes and few but broad side lobes.
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Adaptation	In Sweden north to 62° N. lat.
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Resistance	More resistant against slime fungus (<i>Plasmodiophora brassicae</i>) than most other swede varieties.
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Use	Fodder.
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Certified ?	Yes.
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Grades recognized ?	Original seed sold only by the General Swedish Seed Ltd. For different qualities see page vii.
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Authority for certification	The State Central Seed Control Station.
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On open market ?	Yes, also for export.
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Brassica napus ssp. napobrassica :		Swedes	Weibulls Bangholm Strain 22
Origin	From Bangholm, strain 33.		
Authority	Weibullsholm Plant Breeding Institute, Landskrona, Sweden.		
Characteristics	Root shape globular, colour white, red above ground. Percentage of dry matter about 12.		
Adaptation	All good soils in Europe.		
Use	Fodder.		
Certified ?	Yes.		
Grades recognized ?	Original seed sold by W. Weibull Ltd. For different qualities see page vii.		
Authority for certification	The State Central Seed Control Station.		
On open market ?	Yes, also for export.		

Brassica napus ssp. napobrassica :		Swedes	Wilhelmsburger, strain 28
Origin	From Wilhelmsburger Hunslev VII.		
Authority	Weibullsholm Plant Breeding Institute, Landskrona, Sweden.		
Characteristics	Root shape globular to oval. Colour white with green top. Percentage of dry matter about 11.		
Adaptation	All good soils in Europe.		
Use	Fodder.		
Certified ?	Yes.		
Grades recognized ?	For different qualities see page vii.		
Authority for certification	The State Central Seed Control Station.		
On open market ?	Yes, also for export.		

Brassica napus rapifera : **Swedes** **Borns Friesche**

Origin	Selected from endemic variety.
Authority	F. H. Born, Breeder Barlikun, Friesland, Holland.
Characteristics	Similar to Wassenaars Friesche. Shape of root more oval and branching.
Adaptation	Adapted to a climate suitable for common swede.
Use	For human consumption and fodder for cattle.
Certified ?	Yes.
Grades recognized ?	No.
Authority for certification	N.A.K. General Netherlands Inspection Service for Seeds of Field Crops, Zoomweg 11, Wageningen.
On open market ?	Yes.

Brassica napus rapifera : **Swedes** **Gele Reuzen Z.W.**

Origin	Selected from English variety Non plus ultra.
Authority	N. V. Zwaan en de Wiljes. Wholesale firm, Scheemda, Holland.
Characteristics	Flesh yellow, somewhat tapering, bronze top. Medium size of neck. High yield and percentage of dry matter. Good keeping quality.
Adaptation	Adapted to a climate suitable for common swede.
Resistance	A little sensitive to decomposition and mildew.
Use	Fodder for cattle.
Certified ?	Yes.
Grades recognized ?	No.
Authority for certification	N.A.K. General Netherlands Inspection Service for Seeds of Field Crops, Zoomweg 11, Wageningen.
On open market ?	Yes.

Brassica napus rapifera : **Swedes** **Wassenaars Friesche**

Origin	Selected from endemic variety.
Authority	J. O. Wassenaar, Breeder Menaldum, Friesland, Holland.
Characteristics	Good consumption quality, good yield. Rather well developed, half-erected, sound foliage. Dry matter percentage moderate (± 8).
Adaptation	Adapted to common swede climate.
Resistance	Rather resistant to internal defects (caused by bacteria), and to flea-beetle.
Use	For human consumption and fodder for cattle.
Certified ?	Yes.
Grades recognized ?	No.
Authority for certification	N.A.K. General Netherlands Inspection Service for Seeds of Field Crops, Zoomweg 11, Wageningen.
On open market ?	Yes.

Brassica oleracea : Kale. Marrow-stemmed kale (Chou moellier).

Thousand-headed kale

Types (a) Giant Chou moellier. (b) Medium-stemmed Chou moellier. (c) Thousand-headed kale.

Origin	Developed by maternal line selection from within commercial material of English origin.
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Authority R. A. Calder, New Zealand.

Characteristics (a) A tall-growing form with high yield of total forage but a low proportion of leaf to stem ; stem smooth and well developed and gives a high yield of marrow ; both leaf and stem are palatable ; has a lower dry-matter content than (b) or (c), but gives a higher dry matter yield. (b) is a form of medium height with lower yield of total forage than the Giant type, has a rougher, coarser stem but possesses a higher proportion of leaf to stem ; both leaf and stem are palatable ; has a lower dry-matter content than (c), but gives a higher dry matter yield. (c) is a form typical of true thousand-headed kale, is shorter growing than Chou moellier, but branches freely and possesses a high proportion of leaf to stem ; leaf palatable but stem hard, woody and inedible ; possesses a higher dry matter content than the Chou moellier types, but on account of its lower total yield gives a lower dry-matter yield.

Adaptation As for rape, the kales are suited more particularly for temperate latitudes and possess, within such regions, wide adaptability to varying conditions of soil and climate. They may be grown on a wide range of soil types but, for maximum development, require a rich friable loam well supplied with organic matter. Although they are more resistant to drought than the rapes and can produce fair crops under dry conditions, a cool and humid environment is necessary for high yields.

Resistance As for commercial lines each type possesses considerable resistance to club root and is less susceptible than rape to attack by aphids and diamond-back moth; they can be severely attacked by the white butterfly, however, and may be defoliated during the autumn period but recover as the season gets cooler.

Use	In "Crops and Cropping," prepared by the staff of Lincoln College the following comments on utilization are recorded. "The two kales (Chou moellier and Thousand-headed kale) play a similar role on the farm as do turnip and mangels. They are grown for winter and summer forage on both dairy and sheep farms and provide green forage at periods of the year when this class of feed is scarce. They are a useful supplement to mangels, swedes and turnips for winter feed and are particularly suitable for milking cows. They may also be grown in place of rape as a summer fattening crop for lambs." When grown for winter forage it is generally recognized that Chou moellier is more suitable for early and Thousand-headed kale for late feeding. The crop can be fed off or it may be cut and carted out to the stock.
Certified ?	The multiplication, under certification, of selected stocks of (a), (b) and (c) was commenced in 1942/43 and seed supplies of the (a) and (b) types will be available for distribution for sowing in the spring of 1944 and of (c) in the spring of 1945.
Grades recognized ?	No distinct grades of kale are recognized completely.
Authority for certification	Fields Division, N.Z. Department of Agriculture.
On open market ?	Arrangements have been made to ensure that sufficient supplies of seed of each kale type are raised annually for local requirements; with (a) and (b) such should be available in the spring of 1944 but with (c) not until 1945. As with rape the export of any surplus will depend on economic considerations.

Brassica oleracea acephala : **Kale** **Duizendkoppige kool**

Origin	Selected from English endemic variety.
Authority	N. V. Zwaan en de Wiljes, Wholesale firm, Scheemda, Holland.
Characteristics	Strikes well. Good yield of foliage.
Resistance	Somewhat resistant to top-and-toe disease and frost.
Use	Fodder for cattle.
Certified ?	Yes.
Grades recognized ?	No.
Authority for certification	N.A.K. General Netherlands Inspection Service for Seeds of Field crops, Zoomweg 11, Wageningen.
On open market ?	Yes.

Brassica oleracea acephala : **Marrow-stemmed kale** **Goliath**

Origin	Selected from Gartons.
Authority	Fa D. J. v. d. Habe, Wholesale firm, Kapelle- Biezelinge, Holland.
Characteristics	Easy striking. Good yield of stem and foliage.
Resistance	Resistant to light frost, slightly resistant to top-and- toe disease. Resistant to decomposition.
Use	Fodder for cattle.
Certified ?	Yes.
Grades recognized ?	No.
Authority for certification	N.A.K. General Netherlands Inspection Service for Seeds of Field crops, Zoomweg 11, Wageningen.
On open market ?	Yes.

Brassica oleracea acephala : Marrow-stemmed kale Markanta Groene

Origin	Selected from Chou moellier blanc.
Authority	A. R. Zwaan en Zoon, Wholesale firm, Voorburg, Holland.
Characteristics	Robust stem, medium foliage. Total yield high.
Resistance	Resistant to light frost, a little sensitive to top-and-toe disease.
Use	Fodder for cattle.
Certified ?	Yes.
Grades recognized ?	No.
Authority for certification	N.A.K. General Netherlands Inspection Service for Seeds of Field crops, Zoomweg 11, Wageningen.
On open market ?	Yes.

**Brassica oleracea acephala : Marrow-stemmed kale Witte mergkool
Z.W.**

Origin	Selected from English endemic variety.
Authority	Z. N. Zwaan en de Wiljes, Wholesale firm, Scheemda, Holland.
Characteristics	Good striking capacity. Good yield of stem and foliage.
Resistance	Resistant to light frost and decomposition.
Use	Fodder for cattle.
Certified ?	Yes.
Grades recognized ?	No.
Authority for certification	N.A.K. General Netherlands Inspection Service for Seeds of Field crops, Zoomweg 11, Wageningen.
On open market ?	Yes.

Brassica rapa :	Turnip	Hammenhögs Original Bortfelder
Origin	Selection in the Danish strain Hundslev V.	
Authority	Otto J. Olson and Son Ltd., Hammenhög, Sweden.	
Characteristics	Root white-yellow in colour, long, bulky towards the tip, small topped, percentage dry matter about 8.	
Adaptation	All Sweden.	
Use	Fodder.	
Certified ?	Yes.	
Grades recognized ?	Original seed sold only by Otto J. Olson and Son Ltd. For different qualities see page vii.	
Authority for certification	The State Central Seed Control Station.	
On open market ?	Yes, also for export.	

Brassica rapa :	Turnip	Immuna, strain 26
Origin	A breeding line $\times$ Naepe.	
Authority	Weibullsholm Plant Breeding Institute, Landskrona, Sweden.	
Characteristics	Root rather long with green top. Percentage of dry matter about 8.	
Adaptation	On light soils in all Europe.	
Resistance	Resistant against slime fungus (<i>Plasmodiophora brassicae</i>).	
Use	Fodder.	
Certified ?	Yes.	
Grades recognized ?	Original seed sold by W. Weibull Ltd. For different qualities see page vii.	
Authority for certification	The State Central Seed Control Station.	
On open market ?	Yes, also for export.	

Brassica rapa :	Turnip	Östersundom, strain 05
Origin	Selection in Finnish Östersundom.	
Authority	Swedish Seed Association, Svalöf, Sweden.	
Characteristics	Percentage of dry matter about 8.5. The roots are mostly short conical, white-fleshed and red-violet at top, growing with the half of the length above ground. The tops are luxuriant, dark green, the petioles often a little violet.	
Adaptation	In Sweden north to 69°N. lat.	
Resistance	Rather resistant against slime fungus (<i>Plasmodiophora brassicae</i>).	
Use	Fodder.	
Certified ?	Yes.	
Grades recognized ?	Original seed sold only by the General Swedish Seed Ltd. For different qualities see page vii.	
Authority for certification	The State Central Seed Control Station.	
On open market ?	Yes, also for export.	

Brassica rapa :	Turnip	Östersundom, strain 92
Origin	From Svalöf's Östersundom.	
Authority	Weibullsholm Plant Breeding Institute, Landskrona, Sweden.	
Characteristics	Root rather long with red top. Percentage dry matter about 7.	
Adaptation	On light soils in all Europe.	
Resistance	Resistant against slime fungus (<i>Plasmodiophora brassicae</i>).	
Use	Fodder.	
Certified ?	Yes.	
Grades recognized ?	Original seed sold by W. Weibull Ltd. For different qualities see page vii.	
Authority for certification	The State Central Seed Control Station.	
On open market ?	Yes, also for export.	

Brassica rapa :	Turnip	Svalöfs Bortfelder, strain 01 + 02
Origin	Selections in old strains of Bortfelder.	
Authority	Swedish Seed Association, Svalöf, Sweden.	
Characteristics	Percentage of dry matter about 8.5. The roots are cylindrical, medium long to long, mostly very bulky yellow-fleshed and yellow-green-topped. Growing with two-thirds of length above ground. Tops luxuriant but not uniform.	
Adaptation	In Sweden to 69° N. lat.	
Use	Fodder.	
Certified ?	Yes.	
Grades recognized ?	Original seed sold only by the General Swedish Seed Ltd. For different qualities see page vii.	
Authority for certification	The State Central Seed Control Station.	
On open market ?	Yes, also for export.	

Brassica rapa :	Turnip	Svalöfs Yellow Tankard, Strain 04
Origin	Selection in commercial Yellow Tankard.	
Authority	Swedish Seed Association, Sweden.	
Characteristics	Percentage of dry matter about 9. Roots are medium long, cylindrical, rather bulky, yellow-fleshed and green-topped, growing with about two-thirds of their length above ground. Tops very luxuriant. Rather early.	
Adaptation	In Sweden to 69° N. lat.	
Use	Fodder.	
Certified ?	Yes.	
Grades recognized ?	Original seed sold only by the General Swedish Seed Ltd. For different qualities see page vii.	
Authority for certification	The State Central Seed Control Station.	
On open market ?	Yes, also for export.	

Brassica rapa rapifera :**Turnip****Östersundom**

Authority	The farm of Östersundom, Finland.
Characteristics	Has red neck and white root. Grows rapidly. Very productive, but the percentage of dry matter rather low.
Adaptation	Thrives in North Finland because of rapid growth. Best in light soil.
Resistance	Good persistence.
Use	Valuable fodder turnip especially in North Finland, where other fodder root crops do not grow.
On open market ?	Yes.

Brassica rapa rapifera :**Turnip****Goldi**

Origin	Selected from endemic variety.
Authority	A. R. Zwaan en Zoon, Wholesale firm, Voorburg, Holland.
Characteristics	Flat-round. Yellow flesh, green top. Small, early decaying foliage. Rather good yield of roots. Easy to lift. Little adherence of soil.
Resistance	Somewhat sensitive to top-and-toe disease.
Use	Fodder for horned cattle, and human consumption.
Certified ?	Yes.
Grades recognized ?	No.
Authority for certification	N.A.K. General Netherlands Inspection Service for Seeds of Field crops, Zoomweg 11, Wageningen.
On open market ?	Yes.

Brassica rapa rapifera :**Turnip****Jobe**

Origin	Selected from endemic variety.
Authority	N. V. Joordens, Wholesale firm, Venlo-Blerick, Holland.

Characteristics	Medium late, cylindrical. White flesh. Blue top. Persistent, erected, big foliage. Little adherence of soil. Easy to lift. Good yield.
Resistance	Resistant to top-and-toe disease.
Use	Fodder for horned cattle.
Certified ?	Yes.
Grades recognized ?	No.
Authority for certification	N.A.K. General Netherlands Inspection Service for Seeds of Field crops, Zoomweg 11, Wageningen.
On open market ?	Yes.

Brassica rapa rapifera :	Turnip	Lucratief
Origin	Selected from endemic variety.	
Authority	W. v. d. Lugt, Breeder, Wijhe, Holland.	
Characteristics	Medium late, cylindrical root. White flesh. Good yield, persistent foliage. Easy to lift.	
Resistance	Resistant to top-and-toe disease.	
Use	Fodder for horned cattle.	
Certified ?	Yes.	
Grades recognized ?	No.	
Authority for certification	N.A.K. General Netherlands Inspection Service for Seeds of crops, Zoomweg 11, Wageningen.	
On open market ?	Yes.	

Brassica rapa rapifera :**Turnip****Voorangsstoppelknol**

Origin	Selected from Nijmeegsche lange.
Authority	A. v. d. Elzen, Breeder, Vinkel-Geffen, Holland.
Characteristics	Medium late, cylindrical root. White flesh. Green top. Good yield of persistent, long and narrow foliage. Rather much adherence of soil.
Resistance	Rather good winter hardiness, somewhat sensitive to top-and-toe disease.
Use	Fodder for horned cattle.
Certified ?	Yes.
Grades recognized ?	No.
Authority for certification	N.A.K. General Netherlands Inspection Service for Seeds of crops, Zoomweg 11, Wageningen.
On open market ?	Yes.

Brassica rutabaga :**Swede****Dryland**

Origin	Developed from the cross (Grandmaster × Sensation) × Grandmaster.
Authority	R. A. Calder, New Zealand.
Characteristics	Foliage medium green with a slight bluish tinge, mid-rib and stalks green ; skin colour bronze to drab red ; globe shaped with relatively deep tap-root often associated with pronounced fang-development ; flesh yellow.
Adaptation	The growing of swedes is confined almost entirely to temperate latitudes as they thrive best in a cool moist environment ; under hot dry conditions growth is restricted and they become subject to attack by aphid and diamond black moth. They are rather high fertility demanders and the most suitable soil type is a rich, friable, well drained loam. The "Dryland" type with its more extensive root development seems better able to withstand dry conditions than many other varieties and it might be of value in those arable areas experiencing low summer rainfall.

Resistance	Susceptible to club root and to dry rot (<i>Phoma lingam</i>) but possesses some resistance to turnip mosaic and to aphids and to diamond-black moth.
Use	Swedes are used mainly for wintering ewes, hoggets, heifers and milking cows and for this purpose may be either fed off in the field or pulled and pitted and later carted out. It is customary when feeding swedes to supplement the diet with either hay, chaff or silage.
Certified ?	Seed has not yet been distributed but a small increase area was sown for harvesting in the 1944/45 season. The produce is to be used for further trial and further multiplication if warranted.
On open market ?	No seed supplies yet available commercially.

Bromus arvensis :	Field brome-grass	Pyramid
Origin	Selection in commercial field brome-grass.	
Authority	Weibullsholm's Plant Breeding Institute, Landskrona, Sweden.	
Characteristics	Dark violet heads.	
Adaptation	Southern Sweden.	
Use	Hay.	
Certified ?	Yes.	
Grades recognized ?	Original seed sold only by W. Weibull Ltd.; also other seed in the market. For different qualities see p. vii.	
Authority for certification	The State Central Seed Control Station.	
On open market ?	Yes, also for export if available.	

Bromus arvensis :	Field brome	Svalöfs Original Renlosta (Svalöf's Original Field Brome)
Origin	Single plant selection in wild Swedish material.	
Authority	Swedish Seed Association, Svalöf, Sweden.	
Characteristics	Leafy, high-yielding.	
Adaptation	Southern Sweden.	
Use	Hay.	
Certified ?	Yes.	
Grades recognized?	Original seed sold only by the General Swedish Seed Ltd. ; also other seed in the market. For different qualities see p. vii.	
Authority for certification	The State Central Seed Control Station.	
On open market ?	Yes, also for export if available.	
Bromus inermis :	Brome	Parkland
Origin	The increased progeny of a 3rd generation inbred line descending from a single plant selected in 1923 along a roadway near Saskatoon.	
Authority	Dominion Forage Crops Laboratory, Saskatoon, Canada.	
Characteristics	Rhizomes are present but the spread of the plant is restricted to about 60 per cent of that of ordinary brome. Culms are almost as tall as in ordinary brome. Considerably more sterile culms than in ordinary brome. Leaves variable in length and width. Percentage of leaf is about 52 compared to about 42 for Common brome, largely due to the higher percentage of sterile culms. Panicle is indistinguishable from but considerably less abundant than that of ordinary brome. A certain degree of sterility exists. Seed yield is about 50 to 60 per cent of Common brome. Seed is indistinguishable from that of ordinary brome. The higher proportion of sterile florets which often do not detach completely in threshing tends to result in a slightly lower bushel weight.	
Adaptation	Adapted to semi-arid to fairly humid conditions and soil varying in texture from clay to sandy loam. Will withstand flooding about 21 to 28 days in early spring. Does best in fairly cool summer climate. Latitude of adaptation is about 40° to 45° N. to limit of northern settlement.	

Resistance	No specific resistance to disease or insect pests. Some infection with <i>Septoria</i> leaf spot is usually present. Comparable to Common brome in drought resistance and winter hardiness.
Use	For hay and pasture. Somewhat more palatable as pasture than Common brome.
Certified ?	Yes.
Grades recognized ?	Yes. On basis of ancestry, isolation of field, germination, weed seed content.
Authority for certification	Registered seed is controlled by Canadian Seed Growers Association, Ottawa, Ontario, and certified seed by the Production Service, Plant Products, Department of Agriculture, Ottawa, Ontario.
On open market ?	Yes.
Bromus inermis :	Brome grass Superior, Sask. 38
Origin	Progeny of a few single plant selections from a large field of ordinary brome grass on the home farm of the late Hon. W. R. Motherwell, former Minister of Agriculture.
Authority	Field Husbandry Department University of Saskatchewan, Saskatoon, Canada.
Characteristics	Stems tall and slender. Heads panicle. Seeds light brown. Leaves broad pointed. Rhizomes spreading. Perennial.
Adaptation	Temperate climate with rainfall of from 14 to 25 in. ; latitude 46° to 54° N. Soils, clay loams to medium sandy loams.
Resistance	Resistant to winter killing. Only ergot has given any serious trouble. Not injured by insects.
Use	Used as hay and pasture ; restores root fibre to soil, and in field borders controls weeds and reduces damage to wheat fields by wheat-stem saw fly.
Certified ?	Yes.
Grades recognized ?	Yes ; on the basis of purity, viability and quality.
Authority for certification	Canadian Seed Growers' Association, Dominion Department of Agriculture.

Bromus inermis :**Bromegrass****S-1248**

Origin	Single plant selected near Saskatoon in 1923 and inbred for 4 generations. One 4th generation inbred line increased.
Authority	Dominion Forage Crops Laboratory, Saskatoon, Sask., Canada.
Characteristics	Rhizomes are present but spread of plants is about 40 percent of that of common brome. Culms are almost as tall as in ordinary brome and sterile culms are no more abundant. More leafy than ordinary brome. Leaves soft and of fairly uniform texture and size. Panicles and seed are indistinguishable from ordinary brome.
Adaptation	Adapted to semi-arid to fairly humid conditions and soil varying in texture from clay to sandy loam. Will withstand flooding about 21 to 28 days in early spring. It grows best in moderately cool summer climate. Latitude of adaptation 40-45°N. to limit of northern settlement.
Resistance	Susceptible to attack by <i>Septoria</i> leaf spot. No specific resistance to disease or pests. Drought resistance and winter hardiness comparable to common brome.
Use	Hay and pasture.
Certified ?	No.
Grades recognized ?	No.
On open market ?	No.

Bromus inermis :**Bromegrass****S-1249**

Origin	Single plant selected near Saskatoon in 1923 for restricted rhizome development and a 3rd generation inbred line increased.
Authority	Dominion Forage Crops Laboratory, Saskatoon, Sask., Canada.
Characteristics	Rhizomes are present but their spread is restricted to 80 percent of that of ordinary brome. Culms are as tall as in ordinary brome, also as leafy as ordinary

brome and leaf type fairly uniform. Leaves fairly large and dark green. Panicle and seed are indistinguishable from those in ordinary brome grass.

Adaptation	Adapted to semi-arid to fairly humid conditions and to soil varying in texture from clay to sandy loam. Withstands flooding 21 to 28 days in early spring. Prefers moderately cool summer climate. Latitude of adaptation is about 40-45°N. to limit of northern settlement.
Resistance	No marked resistance to any disease or to pests. Drought resistance and winter hardiness comparable to ordinary brome.
Use	Hay and pasture.
Certified ?	No.
Grades recognized ?	No.
On open market ?	No.

Bromus unioloides [syn. *B. catharticus*] **Prairie Grass** **Selected strains**

Origin	Strains have been selected from material originally received from (1) North Canterbury, New Zealand. (2) Burdett Swamp, River Murray, South Australia. (3) " Perennial prairie grass " originally introduced into Australia under the incorrect name of <i>B. marginatus</i> and grown at Dundas, New South Wales.
Authority	Council for Scientific and Industrial Research and Waite Agricultural Research Institute, Australia.
Characteristics	Vigorous strains of the common type.
Resistance	Immune to prairie grass smut (<i>Ustilago bromivora</i>).
Use	Pasture and hay.
On open market ?	Seed has been multiplied but is not available commercially.

Bromus unioloides : **Prairie Grass** **New South Wales selected strain**
[syn. *B. catharticus*].
Authority New South Wales Department of Agriculture,
Australia.

Use Pasture and hay.

On open market ? Seed is available commercially.

Carthamus tinctorius : **Safflower** **Imperial Pusa 30**
Origin Selection from material obtained from Bengal and
Bihar.

Authority Bot. Sect., Imp. Agric. Res. Inst., New Delhi, India.

Characteristics Stem 125 cm. in height, branched, erect, fleshy and succulent up to the stage of production of flowering shoots. Lower leaf 15 × 4 cm. oblanceolate, dark green, spineless, succulent and soft ; inflorescence leaves lanceolate, spineless. Flower head yellow fading to red. Florets in mature buds deep yellow with a red spot on the apex. Achenes 0.25 in. smooth, obovoid at top, obliquely 4-angular, with four ribs, weight of 100 seeds 3 grms ; oil content 23 per cent. Sown in early November, crop matures in 6 months under Delhi conditions.

Adaptation Grows both under dry and humid climate, but cannot stand continuous wet weather. Thrives best on open sandy soils. Latitude 15°-35°N.

Resistance Susceptible to *Acanthiophilus helianthi* which attacks flower buds. Drought and frost resistant.

Use Silage ; oilcake after extraction of oil from seeds.

Certified ? Yes.

Grades recognized ? No.

Cenchrus ciliaris : **Kolukattai grass** **White**
Origin Natural.

Authority Lecturer in Botany, Madras, India.

Characteristics Slightly hairy at leaf sheath and bases. Perennial herb, growing to 2-3 feet. Flower spikelets enclosed in filiform bristles.

Adaptation	Adapted to Coimbatore climate with an average rainfall of 25 in. Yields 30-50 thousand lb. per year.
Resistance	Fairly drought resistant.
Use	Pasture grass.
Certified ?	Yes.
Grades recognized ?	Yes ; on the basis of colour of glumes.

Cenchrus ciliaris :	Zeerust Strain
Origin	A geographic strain from Zeerust, Transvaal.
Authority	[Information supplied by] Dr. L. E. W. Codd, South Africa.
Characteristics	Leafy strain.
Adaptation	For regions with a summer rainfall of 20-25 in. per annum.
On open market ?	Not yet produced in quantity.

Cenchrus setigerus :	Black
Origin	Natural.
Authority	Lecturer in Botany, Madras, India.
Characteristics	Perennial herb. Flower spikelets enclosed in spinous bristles. Black glumes.
Adaptation	Adapted to Coimbatore climate with an average rainfall of 25 in. Yields 20-40 thousand lb. per year.
Resistance	Comparatively more drought resistant than the white variety.
Use	Pasture grass.
Certified ?	Yes.
Grades recognized ?	Yes ; on basis of colour of glumes which are black.

Chloris gayana :	Rhodes grass	A selection
Origin	—	
Authority	Fodder Specialist, Government of Punjab, India.	
Characteristics	Perennial; stems prostrate at the base and often form stolons. Stalks 3 to 4 ft. high, slightly compressed, ungrooved and branching at the nodes. Nodes brownish. Leaf sheaths smooth and 2 to 3 in. long; blades about 1 ft. long, linear, lanceolate. Ligule is a fringe of hairs. Inflorescence a one-sided spike. Spikelets awned. Does not form seed under Punjab conditions and is propagated through root stocks.	
Adaptation	Grows throughout the Province under irrigated conditions. Planting can be done any time from Feb. to August, on all except light sandy soils.	
Resistance	Drought resistant. No damage from disease or pest has been noticed.	
Use	Cut and fed green or pastured and can be turned into silage or made into hay. A good sand binder.	
Certified ?	Yes.	
Grades recognized ?	No.	
Authority for certification	Department of Agriculture, Punjab.	

Chloris gayana :	Rhodes grass	Nzoia
Origin	Ecotype found west of the Nzoia River.	
Authority	Agricultural Department, Kenya. Tested and increased by D. C. Edwards (see <i>E. Afr. Agric. J.</i> Vol. 9. pp. 62-68. 1943).	
Characteristics	Stoloniferous and leafy. Flowering stems 4 ft. in height. Stated as the result of trials in Queensland, Australia to be late-flowering, but this character is not conspicuous in Kenya. Persistent for 8 years under severe clipping treatment in Kenya, and markedly more persistent than commercial varieties	

of the grass. Highly palatable to cattle. Yields are heavy.

Adaptation	Not yet fully known. Probably confined to the tropics. The conditions under which the grass can be used in Kenya are approximately, minimum rainfall 25-30 in. per annum, altitudes 4000 to 6500 ft. Appears to be widely adaptable in regard to soil; success has been obtained on both the deep, red, lateritic loam and the almost black, clay loam main soil types.
Resistance	Diseases and pests have so far been insufficiently important to attract attention. Drought resistance appears to be moderately good. The grass has not been used in an area where frost occurs and it requires moderately high temperatures for the best results.
Use	Suitable for hay, pasture and silage. The most suitable plan appears to be combined use for hay and pasture. The stoloniferous habit of the grass suggests that it might be of value for soil conservation.
On open market ?	Comparatively small quantities of seed have been available on the open market in Kenya for the past few years.

Citrullus vulgaris :	Melons	Selection
Characteristics	Yields 1 ton per dunam (=1000 sq. m.).	
Adaptation	Adapted to all Palestine. Summer growth without irrigation.	
Resistance	Mildew resistant.	
Use	Stock feed.	
Certified ?	No.	
Grades recognized ?	No.	
On open market ?	Yes.	

Cynodon dactylon :	Doob	A local grass
Origin	Punjab.	
Authority	Fodder Specialist, Sirsa, Punjab, India.	
Characteristics	Deep-rooted with strongly developed creeping stems. Leaves are 1 to 2 in. long, linear, smooth and dark green. Flowering culms are short and terminate in one-sided spikes. Some seed is formed but it is usually propagated by cuttings.	
Adaptation	Grows on all soils but prefers heavier types. Warm and moist climates are best.	
Resistance	Drought-resistant. No disease or pest has been recorded.	
Use	Can be cut and fed green, pastured, turned into silage and made into hay. A good sand binder.	
Certified ?	Yes.	
Grades recognized ?	No.	
Authority for certification	Department of Agriculture, Punjab.	

Cynodon plectostachyum :	Giant Star Grass	Lake Shirwa
Origin	Lake Shirwa.	
Authority	Vivekananda Laboratory, Almora, U.P., India.	
Characteristics	Perennial grass. First the grass creeps; when clumps develop from nodes stems grow up to 3-4 feet. Flowers form a panicle of spikelets. HCN content of the grass diminishes with age, and is mostly confined to leaf. Unusually large yield is obtained, two cuts in the hills and three in the plains. In Coimbatore, yield as high as 60,000 lb. per acre has been obtained in three cuts. Despite the HCN content, the grass is safe for cattle. Mature star grass hay contains only traces of HCN. Hay by itself can form maintenance ration for cattle. Both fresh grass and hay are relished by cattle.	
Adaptation	Grows well at altitudes up to 5500 ft. and requires at least 30 in. of rainfall. Grows best in alluvial soil.	

Resistance	No disease has yet been observed. Compared to other local grasses, these grasses are more resistant to frost.
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Use	Excellent for pasture and hay and decidedly so for soil erosion on account of its extremely rapid growth.
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Certified ?	No.
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Grades recognized ?	No.
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There are several strains of African grasses which go by the name of Giant Star Grass. Of the five strains raised, four belong to *Cynodon* and one to *Eleusine*. The hydrocyanic contents of different strains have been found to vary. For the lower HCN content, Lake Shirwa strain of *Cynodon* and Lake Naivasha strain of *Eleusine* have been cultivated. See also page 120.

Dactylis glomerata :	Cocksfoot	Gippsland Old Pasture
Origin	Regional strain evolved by natural selection from original sowings of European seed.	

Authority	Some enterprising farmers have regularly harvested seed and the Dept. Agric. in Victoria, Australia, has grown the strain in comparative trials.
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Characteristics	A fine leaved, hardy type which makes early growth.
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Adaptation	Is quasi-indigenous on fertile, loose textured, red basaltic soils of Gippsland. Meteorological and other data for Leongatha, a centre where the strain grows, are as follows : Latitude 38°25'S. Longitude 145°58'E., Elevation 273 ft. Average rainfall 3954 points, Mean maximum temperature 66.3°. Mean minimum temperature 47.0°. The strain also grows well under irrigation in Victoria.
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Resistance	A hardy summer type.
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Use	Pasture and hay.
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Certified ?	No.
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Grades recognized ?	No.
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On open market ?	Seed is harvested and sold commercially in limited amounts.
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Dactylis glomerata :	Orchard grass	Avon
Origin	Developed from a strain obtained from Sweden through the Swedish Farmers' Association in 1911.	
Authority	Agronomy Department, Macdonald College, McGill Univ., Quebec, Canada.	
Characteristics	Stems, leaves, panicles and seeds show the same variations as in all orchard grass strains of commerce. This strain reaches the flowering and seed stage earlier than most strains with which comparisons have been made at Macdonald College. It is decidedly of the early (hay) type.	
Adaptation	Although more winter hardy than other strains with which careful comparisons have been made at Macdonald College, it is not sufficiently hardy to stand severe winters in Quebec without injury. It might prove of greater value under less severe winter conditions.	
Resistance	No special disease resistance can be claimed, but the strain has proved more winter hardy than others tested at Macdonald College. In tests conducted by the Bureau of Plant Industry at stations in U.S.A. it appeared to be somewhat lacking in drought resistance but relatively winter hardy as compared with other strains under test.	
Use	Although not regarded as sufficiently hardy for use in pasture mixtures in Quebec, might prove of value in regions with less severe winter conditions.	
Certified ?	No. Seed is available from Macdonald College in small amounts for testing purposes.	
Dactylis glomerata :	Orchard grass	Hercules
Origin	Developed by mass selection from material obtained many years ago from Manchuria.	
Authority	Division of Forage Plants, Central Experimental Farm, Ottawa, Ont., Canada.	
Characteristics	An upright relatively tall, leafy strain. Matures from 7 to 10 days later than commercial orchard grass. Seeds are characteristic of the species.	
Adaptation	Adapted to Quebec, Ontario and British Columbia. Should be adaptable to all areas where orchard grass thrives.	

Dactylis glomerata :	Cocksfoot	Tammisto
Origin	Raised from wild plants of Finnish origin.	
Authority	Plant Breeding Station, Tammisto, Finland.	
Characteristics	Germination is not prompt based on Swedish standards. Early development also is slower by Swedish standards. Leafy, root foliage strong. Later than foreign cocksfoots.	
Adaptation	Thrives best in South and Central Finland.	
Resistance	Good wintering.	
Use	Suitable for grazing or mowing but not as valuable as meadow fescue for these purposes.	
On open market ?	Yes, marketed in 1928.	

Dactylis glomerata :	Cocksfoot	Aberystwyth S 26
Origin	Based on indigenous material.	
Authority	Welsh Plant Breeding Station, Aberystwyth, Great Britain.	
Characteristics	Intermediate in type between S 37 and S 143. Individual plants are large and leafy, and the strain is later flowering, more leafy, more persistent under grazing conditions, and tillers more profusely than the Danish and other similiar types.	
Adaptation	Valuable on dry hill slopes and also at high elevations. Persistent under grazing.	
Use	Can be regarded as a pasture type, but gives good crops of leafy hay. Probably one of the best grasses for hay mixtures at high elevations, on soils of medium fertility.	
Certified ?	Yes.	
Grades recognized?	Certified.	
Authority for certification	Welsh Plant Breeding Station.	
On open market ?	Yes.	

Dactylis glomerata :	Cocksfoot	Aberystwyth S 37
Origin	Strain is of multiple origin, the initial plant material having been selected on the basis of type rather than source of origin.	
Authority	Welsh Plant Breeding Station, Aberystwyth, Great Britain.	
Characteristics	Basic type plants are relatively erect and well leafed up, the stems giving more leafy hay than the Danish type, while they are only slightly later in flowering.	
Adaptation	Under extreme conditions (dry soils and/or hard grazing), it is less persistent than S 26 and S 143.	
Use	Mainly for hay, but valuable for pasture where in hay mixtures it may constitute up to 50 per cent of the grasses sown.	
Certified ?	Yes.	
Grades recognized ?	Certified.	
Authority for certification	Welsh Plant Breeding Station.	
On open market ?	Yes.	

Dactylis glomerata :	Cocksfoot	Aberystwyth S 143
Origin	Based on indigenous plant of a rather extreme type which was designated "mop" cocksfoot owing to the dense broad cushions produced by individual spaced plants.	
Authority	Welsh Plant Breeding Station, Aberystwyth, Great Britain.	
Characteristics	Plants are relatively spreading with a profusion of tillers, the leaves being broad and palatable ; a more extreme pasture type than S 26.	
Adaptation	Valuable for hard grazing, especially on dry slopes, where soil is light.	
Use	For pastures at high elevations : in conjunction with S 23 ryegrass, <i>Cynosurus cristatus</i> and wild white clover, it gives productive herbage.	
Certified ?	Yes.	
Grades recognized ?	Certified.	
Authority for certification	Welsh Plant Breeding Station.	
On open market ?	Yes.	

Dactylis glomerata : **Cocksfoot** **Cc 196**
Origin " Wild " material from Central Scotland.

Authority Scottish Society for Research in Plant Breeding,
 Corstorphine, Edinburgh, Great Britain.

Characteristics Grows well under pasture conditions ; it has broad,
 soft leaves which are readily eaten by cattle and
 sheep ; it commences growth early in the spring and
 continues to produce leafage during a long period
 of the growing season.

Adaptation Has given good results in the county of Midlothian
 (lat. 56°) at elevations of 200-900 feet above sea level
 under the following environmental conditions :
 Estimated accumulated temperature April-September
 inclusive 1700- over 1900 day °F. Ground frost
 occurs on about 72 days in the year at the lower
 elevations. Mean annual rainfall 27-32 inches.

Use Primarily intended for pasture but provides heavy
 cuts of succulent herbage suitable for silage. Palatable
 to stock.

Certified ? No certification scheme operates.

On open market ? So far authentic stocks have been available only to
 members of the Scottish Society for Research in
 Plant Breeding.

Dactylis glomerata : **Cocksfoot** **Kropaar Heidemaaty**
Origin —

Authority Ned. Heidemaatschappij, Arnhem, Holland.

Characteristics Rich rather soft foliage, good tillering capacity, comes
 into ear late.

Resistance Resistant to drought and shade.

Use Suited for 1-year leys.

Certified ? Yes.

Grades recognized? No.

Authority for certification N.A.K. General Netherlands Inspection Service for
 Seeds of Fields Crops, Zoomweg 11, Wageningen.

On open market ? Yes.

Dactylis glomerata :**Cocksfoot****C. 23.****See note on page vi**

Origin	Derived from offspring crosses between plants produced from one self-pollinated selection of Akaroa cocksfoot. Mother and standard grade may also be from tested natural ecotypes.
Authority	Canterbury Agricultural College, Lincoln, New Zealand.
Characteristics	Has finer leaves and a denser crown than Akaroa cocksfoot and there is less variation within the strain.
Adaptation	Temperate climate : more winter green than Akaroa cocksfoot.
Resistance	Relatively free from diseases.
Use	Specifically a grazing type with a fine dense crown which reacts to intensive grazing better than the coarser and more open crown of Akaroa cocksfoot. Can be usefully employed in hay mixtures.
Grades recognized ?	N.Z. Certified pedigree C.23 strain " " Mother " " permanent pasture.
Authority for certification	N.Z. Department of Agriculture.
On open market ?	All certified grades commercially available.

Cocksfoot is the only species of the genus that figures in N.Z. grasslands. It is of very great value in all dairying pastures and on hill country for cattle grazing. It fails to survive at all well under intense grazing particularly in fat lamb production. Here it will not withstand the strong competition of perennial ryegrass under a full and efficient grazing management. There are some very old stands of cocksfoot in N.Z. and the ecotype that has developed is a moderately good leafy herbage type.

See note on page 111

Origin	Breeding from tested ecotypes from old established areas on the Akaroa Peninsula and other parts of N.Z.
Authority	Grasslands Division, Plant Research Bureau, Dept Scientific and Industrial Research, New Zealand.
Characteristics	Perennial, tufted, fairly dense and leafy; good seeder.
Adaptation	Moderately high soil fertility demander, mild-drought tolerant, wide climatic range but not tolerant of excessive cold or heat.
Resistance	Relatively free from diseases.
Use	Long rotation and permanent pasture for dairying. Cattle feed on hill country. Excellent for hay and silage, and as conserved in-situ herbage for special summer and winter grazing.
Grades recognized ?	In process of development.
Authority for certification	N.Z. Department of Agriculture when commercial stocks are available.
On open market ?	Nucleus pedigree stocks only, at present.

Hay Strain

See note on page 111

Origin	Breeding from world ecotypes but mostly from N.Z. Akaroa type.
Authority	Grasslands Division, Plant Res. Bur., Dept. Sci. Ind. Res., New Zealand.
Characteristics	Tall growing, dense, high producer, rapid establishment from seed.
Adaptation	Temperate climate.
Resistance	Relatively free from diseases.
Use	Designed to fit in with short rotation ley systems and for bulky hay and silage crops.
Grades recognized ?	In process of development.

Authority for certification	Department of Agriculture when commercial stocks are available.
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On open market ?	Nucleus pedigree stocks only at present.
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Dactylis glomerata :	Cocksfoot	Brage
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Origin	Single plant selection in material from Germany.
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Authority	Swedish Seed Association, Svalöf, Sweden.
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Characteristics	Late, very good regrowth, very leafy.
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Adaptation	Southern and middle Sweden.
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Resistance	Winter hardy, drought resistant.
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Use	Hay, pasture, silage, artificially dried fodder.
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Certified ?	Yes.
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Grades recognized ?	Originally seed sold only by the General Swedish Seed Ltd.; also other seed in the market. For different qualities see page vii.
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Authority for certification	The State Central Seed Control Station.
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On open market ?	Yes, also for export.
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Dactylis glomerata :	Cocksfoot	Gullåker
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Origin	Selection in Hammenhög's cocksfoot No. 1.
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Authority	Otto J. Olson and Son., Ltd., Hammenhög, Sweden.
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Adaptation	Southern and middle Sweden.
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Use	Hay.
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Certified ?	Yes.
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Grades recognized ?	Original seed sold only by Otto J. Olson and Son, Ltd. Also other seed in the market. For different qualities see p. vii.
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Authority for certification	The State Central Seed Control Station.
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On open market ?	Yes. Also for export.
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Dactylis glomerata :**Cocksfoot****Minerva II**

Origin	Selection in commercial cocksfoot.
Authority	Weibullsholm's Plant Breeding Institute, Landskrona, Sweden.
Characteristics	Medium late, leafy.
Adaptation	Southern Sweden.
Resistance	High resistance against rust.
Use	Hay, silage.
Certified ?	Yes.
Grades recognized ?	Original seed sold only by W. Weibull, Ltd. Also other seed in the market. For different qualities see page vii.
Authority for certification	The State Central Seed Control Station.
On open market ?	Yes, also for export if available.

Dactylis glomerata :**Cocksfoot****Skandia II**

Origin	Single plant selection in material from southern Sweden.
Authority	Swedish Seed Association, Svalöf, Sweden.
Characteristics	Rather late, leafy.
Adaptation	Southern and middle Sweden.
Resistance	Winter hardy, drought resistant.
Use	Hay, pasture, silage, artificially dried fodder.
Certified ?	Yes.
Grades recognized ?	Original seed sold only by the General Swedish Seed, Ltd. ; also other seed in the market. For different qualities see page vii.
Authority for certification	The State Central Seed Control Station.
On open market ?	Yes, also for export.

Dactylis glomerata :**Cocksfoot****Tardus II**

Origin	Repeated selection in Svalöf's Skandia cocksfoot.
Authority	Weibullsholm's Plant Breeding Institute, Landskrona, Sweden.
Characteristics	Late, leafy.
Adaptation	Southern Sweden.
Resistance	Resistant against rust.
Use	Hay, silage.
Certified ?	Yes.
Grades recognized ?	Original seed sold only by W. Weibull, Ltd. Also other seed in the market. For different qualities see page vii.
Authority for certification	The State Central Seed Control Station.
On open market ?	Yes, also for export if available.

Daucus carota :**Red carrot Flakkeesche stomppuntige Hobbel**

Authority	A. D. Hobbel, Breeder Ooltgensplaat, Holland.
Characteristics	Good yield, easy to lift, cylindrical shape. little branching. Little bolting.
Use	For human consumption and fodder for horses.
Certified ?	Yes.
Grades recognized ?	No.
Authority for certification	N.A.K. General Netherlands Inspection Service for Seeds of Field crops, Zoomweg 11, Wageningen.
On open market ?	Available for both open market and export.

Daucus carota :	Red carrot	Giganta
Origin	Selection from Flakkeesche wijnpeen.	
Authority	A. R. Zwaan en Zoon, Wholesale firm, Voorburg, Holland.	
Characteristics	Similar to Flakkeesche stomppuntige Hobbel.	
Use	For human consumption and fodder for horses.	
Certified ?	Yes.	
Grades recognized ?	No.	
Authority for certification	N.A.K. General Netherlands Inspection Service for Seeds of Field crops, Zoomweg 11, Wageningen.	
On open market ?	Available for both open market and export.	

Daucus carota :	Yellow carrot	Limburgia
Origin	Selected from an endemic variety.	
Authority	N. V. Zwaan en de Wiljes, Wholesale firm, Scheemda, Holland.	
Characteristics	Long root, a little outstanding above soil, slender top, low percentage of dry matter, but high yield. Little bolting and adherence of soil.	
Use	Fodder for cattle, suited for hotch potch.	
Certified ?	Yes.	
Grades recognized ?	No.	
Authority for certification	N.A.K. General Netherlands Inspection Service for Seeds of Field crops, Zoomweg 11, Wageningen.	
On open market ?	Available for both open market and export.	

Daucus carota :	Yellow carrot	Lobri
Authority	A. R. Zwaan en Zoon, Wholesale firm, Voorburg, Holland.	
Characteristics	Tapering pointed, flesh soft yellow. Green top. Rises a little above the soil. Good yield, easy to lift, little branching, little bolting.	
Use	Fodder for cattle, suitable for hotch potch.	
Certified ?	Yes.	
Grades recognized ?	No.	
Authority for certification	N.A.K. General Netherlands Inspection Service for Seeds of Field crops, Zoomweg 11, Wageningen.	
On open market ?	Available for both open market and export.	

Daucus carota :	Winterproof red carrot	Robra
Origin	Selected from Belgian endemic variety.	
Authority	N. V. J. Joordens, Wholesale firm, Venlo-Blerick, Holland.	
Characteristics	Winterproof, red flesh, long tapering root, large top. High dry matter content. Difficult to lift. Slow in the beginning of growth. Rather good yield. Carotene content high.	
Resistance	Winter hardy.	
Use	Suited for human consumption and cattle fodder.	
Certified ?	Yes.	
Grades recognized ?	No.	
Authority for certification	N.A.K. General Netherlands Inspection Service for Seeds of Field crops, Zoomweg 11, Wageningen.	
On open market ?	Available for both open market and export.	

Daucus carota :	Carrot	Regulus
Origin	From Dutch Gigantia.	
Authority	Weibullsholm Plant Breeding Institute, Landskrona, Sweden.	
Characteristics	Root long, blunt-ended, colour red. Percentage of dry matter 11-12.	
Adaptation	Light soils in all Europe.	
Use	Fodder.	
Certified ?	Yes.	
Grades recognized ?	For different qualities see page vii.	
Authority for certification	The State Central Seed Control Station.	
On open market ?	Yes, also for export.	

Daucus carota	Carrot	Svalöfs Gul Champion
Origin	Selection in an old strain of Gul Champion imported from Denmark.	
Authority	Swedish Seed Association, Sweden.	
Characteristics	Percentage of dry matter 11-12. The yellow-fleshed roots are medium long, smooth, broad conical. Very broad shoulder and thin neck. The tops are luxuriant.	
Adaptation	In Sweden to 62° N. lat.	
Use	Fodder.	
Certified ?	Yes.	
Grades recognized ?	Original seed sold only by the General Swedish Seed Ltd. For different qualities see page vii.	
Authority for certification	The State Central Seed Control Station.	
On open market ?	Yes, also for export.	

Dolichos lablab :**Popat****E.B. 1**

Origin

Selected from an indigenous variety.

Authority

The Second Economic Botanist to the Government, C.P., and Berar, Nagpur, India.

Characteristics

Stem prostrate, twining when supported, glabrous, usually 5-10 ft. long; succulent; branching freely. Pinnately trifoliate, very small stipules. Leaflets broad, ovate, 3-4 in. long and sometimes equally broad, rather abruptly slender, acuminate apex. Flowers white, arranged on terminal elongated racemes. Standard very broad about 1 in. long, auricled at base; wings adnate to the keel. Pod flat, about 2 in. long, smooth, somewhat curved. Seed white, flat, oblong with rounded ends; 1-3 in. or less in length, the hilum and raphe long and prominent. An annual herb, sown in June or July after break of monsoon and ready for harvest from October to December. Single cut is obtained.

Adaptation

Adapted to all kinds of soils varying from sandy to clay loams, where there is annual rainfall of 20-50 in. in sub-tropical climate. Latitude of the province where grown is 15°-24°.

Use

Green fodder (soilage).

Certified ?

Yes.

Grades recognized ?

Yes.

Authority for
certification

Director of Agriculture, Central Provinces, and Berar, Nagpur.

Ehrharta calycina :**Perennial Veldt Grass****Unnamed**

Origin

Naturalized near Perth in Western Australia.

Authority

Work is in progress by the Council for Scientific and Industrial Research, Australia.

Adaptation

Adapted to light textured soils in the winter rainfall zone of Australia in areas with low to moderate rainfall (15 to 20 in. p.a.).

Resistance

Drought resistant.

Use

Pasture or meadow hay.

On open market ?

Seed is not available commercially.

Eleusine sp. :**Lake Naivasha**

Origin	Lake Naivasha.
Authority	Vivekananda Laboratory, Almora, U.P., India.
Characteristics	Flowers form cruciform digitate spikes. For remaining details see notes for <i>Cynodon plectostachyum</i> on pp. 104-105.

Elymus junceus :**Russian wild ryegrass****S-114**

Origin	Increase of an introduction made in 1927 from Institute of Applied Botany, Leningrad.
Authority	Dominion Forage Crop Laboratory, Saskatoon, Sask., Canada.
Characteristics	Roots fibrous. In solid seeded stands, fairly tall solid culms are produced rather sparsely. Leaves abundant at the base of the plant, long and fairly soft textured. Spike and seed are typical of <i>Elymus</i> but seed has very short awn. Palatable to all classes of stock, particularly from late spring onward.
Adaptation	For semi-arid to fairly humid conditions, and soils varying in texture from clays to sandy loams. Withstands low winter temperatures. Latitude of adaptation, probably 40° to limit of northern settlement.
Resistance	No specific disease or pest resistance. Comparable to crested wheatgrass in drought resistance.
Use	A pasture grass in mixtures with taller growing species.
Certified ?	No.
Grades recognized?	No.
On open market ?	No.

Eragrostis tef :**Unibruin, Inbruin, Uniwit,
Inwit, Erowit**

Origin	Selected from Abyssinian importations.
Authority	[Information supplied by] Dr. D. G. Haylett, South Africa.
Characteristics	As the names imply, two are brown seeded types and three are white. The average air-dry hay yields per morgen over a period of 5 years of plot tests, compared with common teff, were in tons : Unibruin 8.47; Uniwit 8.03; Inwit 7.97; Inbruin 7.86; Erowit 6.97; Common 5.68.

(1) Unibruin—This variety is uniformly the most productive of the brown seeded types and is the highest yielder of all the varieties tested. It has a fine straw and is very leafy. Compared with common teff the air-dry hay yield is about 50 per cent better than the latter.

(2) Inbruin—This brown-seeded variety does not yield as well as Unibruin and has a much coarser straw. Compared with common teff its yield is 38 per cent better.

(3) Uniwit—This is a fine strawed variety with white seeds. Its yield is about 40 per cent better than common teff.

(4) Inwit—This has a medium coarse straw, white seeds, and does not yield quite as well as Uniwit.

(5) Erowit—This is a very coarse-strawed variety. The yield is lower than the four best varieties but is about 20 per cent better than common teff. It is a vigorous grower and has been able to withstand the cutting effect of wind-blown soil particles in the young seedling stage better than the other varieties.

Adaptation

These five selections have proved to be of superior agronomic value both in plot tests and on a commercial scale at the University Farm, Pretoria. During the season 1941-42 steps were taken to increase supplies of seed of the more promising selections and samples were distributed through the Division of Animal and Crop Production for observation and practical testing in various districts. The reports on the performance of the new varieties have been promising and it is probable that one or more of these new varieties will in time replace common teff in certain sections of the country.

Use

The hay yields of all the new varieties are consistently higher than that of common teff, but all are very much later, 2 to 5 weeks, than common teff. They are all tall-growing and very leafy. If left to mature they tend to become rather coarse and less palatable, and owing to their leafiness, these new types tend to lodge. Practical experience has shown that these disabilities can be overcome by harvesting for hay at a comparatively early hay-stage. This practice at the same time ensures a higher quality hay being produced. The seed yields of the improved varieties are significantly lower than that of common teff, the brown-seeded types producing less seed than the white-seeded types.

Festuca arundinacea :	Tall fescue	Aberystwyth S170
Origin	Based on indigenous material.	
Authority	Welsh Plant Breeding Station, Aberystwyth, Gt. Britain.	
Characteristics	A pasture-hay type, more erect in habit and less coarse than ordinary tall fescue. Starts growth early in spring and flowers early.	
Resistance	Drought resistant when once established.	
Use	Valuable for "early-bite" in spring.	
Certified ?	Yes.	
Grades recognized ?	Certified.	
Authority for certification	Welsh Plant Breeding Station.	
On open market ?	Not yet released for general distribution.	
Festuca elatior :	Meadow fescue	Mefon
Origin	Selections from introductions from Scandinavia, Russia, Central Europe, Great Britain, U.S.A., and Canada.	
Authority	Department of Field Husbandry, Ontario Agricultural College, Canada.	
Characteristics	Strongly perennial with smooth and more vigorous stems than in commercial types. Leaves are dark green, glabrous underneath, and more numerous than in commercial strains. Flower panicle is rather narrow; branches erect and quite similar to commercial type. Seed is similar in size, shape and colour to commercial strains. The strain has great longevity, and is more hardy than commercial strains under central Ontario conditions.	
Adaptation	Suited to eastern, central and southern Ontario, particularly in areas with higher humidity.	
Resistance	Has been selected for disease resistance and hardiness.	
Use	An ingredient in hay-pasture mixtures.	
Certified ?	Yes.	
Grades recognized ?	Purity of type, freedom from foreign seeds, disease resistance, germination and general appearance.	
Authority for certification	Plant Products Division, Dominion Department of Agriculture.	

Festuca elatior :	Meadow fescue	Sturdy
Origin	Original seed obtained in 1916 from Ontario Agricultural College, Canada.	
Characteristics	Height of plants under favourable conditions at Winnipeg, Manitoba, usually range from 28—42 in. when in full bloom. Colour of inflorescence light to medium shades of purple. Anthers mostly purple, varying shades with occasional yellow. Leaves bright green to purple on lower leaf sheaths ; glaucous ; scabrous on upper surface, smooth on lower. Leaf sheaths split and overlapping at base, shorter than internodes. Base of blade including auricle creamy white. Colour of nodes predominantly purple varying in intensity ; occasional nodes colourless.	
Adaptation	A high degree of winter hardiness. Well adapted to the more humid parts of Manitoba.	
Use	For hay and pasture. A somewhat better pasture plant than timothy, having a larger amount of basal growth. Short lived perennial under Manitoba conditions. Superior to common meadow fescue in yield under Manitoba conditions ; also somewhat taller. A good producer of seed.	
Certified ?	Yes.	
On open market ?	Yes.	
Festuca ovina :	Sheeps fescue	Aberystwyth S58
Origin	From indigenous plants.	
Authority	Welsh Plant Breeding Station, Aberystwyth, Gt. Britain.	
Characteristics	Relatively very dense, leafy, dark green.	
Adaptation	For upland grazing.	
Use	For improvement of poor and waste grazings. For use on thin soils, especially those at high altitudes.	
Certified ?	Yes.	
Grades recognized ?	Certified.	
Authority for certification	Welsh Plant Breeding Station.	
On open market ?	Not yet released for general distribution.	

Festuca pratensis :	Meadow fescue	Aberystwyth S53
Origin	Based on indigenous plants derived from old pastures.	
Authority	Welsh Plant Breeding Station, Aberystwyth, Gt. Britain.	
Characteristics	A pasture type, tillering more profusely than ordinary commercial types and therefore forms a denser and more persistent sward.	
Adaptation	Does best on moist soils of good fertility.	
Use	Can give a good crop of late grassy hay, followed by rapid growth of dense aftermath. In absence of ryegrass in the seed mixture, this strain continues well with timothy.	
Certified ?	Yes.	
Grades recognized ?	Certified.	
Authority for certification	Welsh Plant Breeding Station.	
On open market ?	Yes.	
Festuca pratensis :	Meadow fescue	Aberystwyth S215
Origin	Based on indigenous material.	
Authority	Welsh Plant Breeding Station, Aberystwyth, Gt. Britain.	
Characteristics	A erect hay type with more numerous and better leafed-up stems than ordinary commercial. Makes fairly good early spring growth as well as aftermath. Leaves larger and broader than S53 ; flowers later.	
Use	Typically a hay type but will give fairly early spring keep. A heavy hay crop on good soil and for aftermath grazing.	
Certified ?	Yes.	
Grades recognized ?	Certified.	
Authority for certification	Welsh Plant Breeding Station.	
On open market ?	Yes.	

Festuca pratensis :	Meadow fescue	Ensign
Origin	Created by combining a small number of desirable selfed lines.	
Authority	Division of Forage Plants, Central Experimental Farm, Ottawa, Canada.	
Characteristics	Plants are 3 to 3.5 feet in height. Upright and uniform in habit of growth. Leafy bottom growth which forms dense tufts. Seed characters do not deviate from those recognized for the species.	
Adaptation	Adapted to most areas with good summer rainfall.	
Resistance	Resistant to leaf rust and leaf spot.	
Use	Well suited for both hay and pasture. Is productive and has excellent seeding habits.	
Certified ?	Yes, in accordance with the regulations of the Canadian Seed Growers' Association, and the Canada Seeds Act.	
Grades recognized ?	Yes, on the basis of purity, germination and disease.	
Authority for certification	Canadian Seed Growers' Association, and the Plant Products Division, Department of Agriculture, Ottawa, Ont.	
On open market ?	No. Foundation stock seed has been distributed in limited quantities for increase.	
Festuca pratensis :	Meadow fescue	Tammisto
Origin	Raised from wild plants of Finnish origin.	
Authority	Plant Breeding Station, Tammisto, Finland.	
Characteristics	Leafy, root foliage very strong. Late type. Early development slow. Good feed crop.	
Adaptation	Thrives well in moist soil in South and Middle Finland.	
Resistance	Wintering good. Not sufficiently resistant to <i>Puccinia coronata</i> .	
Use	Because of strong root leaves, very suitable for grazing. Its lateness makes it suitable for cultivating with red clover and timothy in lawns.	
On open market ?	Yes, marketed in 1928.	

Festuca pratensis : **Meadow fescue** **Sceemptêr Beemdlangbloem**

Authority	N. V. Zwaan en de Wiljes, Wholesale firm, Scheemda, Holland.
Characteristics	In the beginning tardy, later good development.
Resistance	Not resistant to severe drought.
Use	More adapted to hay land or leys than to permanent pasture.
Certified ?	Yes.
Grades recognized ?	No.
Authority for certification	N.A.K. General Netherlands Inspection Service for Seeds of Field crops, Zoomweg 11, Wageningen.
On open market ?	Yes.

Festuca pratensis : **Meadow fescue** **Bottnia**

Origin	Single plant selection in material from northern Sweden.
Authority	Swedish Seed Association, Upper Norrland Branch Station, Sweden.
Characteristics	Persistent, leafy, high yielding, adapted for long days.
Adaptation	Northern Scandinavia.
Resistance	Winter hardy.
Use	Hay, pasture, silage.
Certified ?	Yes.
Grades recognized ?	Original seed sold only by the General Swedish Seed Ltd. ; also other seed in the market. For different qualities see p. vii.
Authority for certification	The State Central Seed Control Station.
On open market ?	Yes, also for export if available.

Festuca pratensis :	Meadow fescue	Fepra
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Origin	Selection in the Danish strain Lyngby.
Authority	Otto J. Olson and Son Ltd., Hammenhög, Sweden.
Adaptation	North and middle Sweden.
Use	Hay.
Certified ?	Yes.
Grades recognized ?	Original seed sold only by Otto J. Olson and Son, Ltd. Also other seed in the market. For different qualities, see p. vii.
Authority for certification	The State Central Seed Control Station.
On open market ?	Yes, also for export.

Festuca pratensis :	Meadow fescue	Mimer
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Origin	Repeated selection in Weibull's purebred meadow fescue.
Authority	Weibullsholm's Plant Breeding Institute, Landskrona, Sweden.
Characteristics	Stiff straw.
Adaptation	Southern and middle Sweden.
Resistance	Winter hardy.
Use	Hay.
Certified ?	Yes.
Grades recognized ?	Original seed sold only by W. Weibull Ltd. Also other seed in the market. For different qualities see p. vii.
Authority for certification	The State Central Seed Control Station.
On open market ?	Yes, also for export if available.

Svalöfs Sena Angssvingel
(Svalöf's late Meadow Fescue)

Origin	Selection in strain from middle Sweden.
Authority	Swedish Seed Association, Svalöf, Sweden.
Characteristics	Late, leafy, and high-yielding.
Adaptation	Southern and middle Sweden.
Resistance	Resistant to rust.
Use	Hay, pasture, silage.
Certified ?	Yes.
Grades recognized?	Original seed sold only by the General Swedish Seed Ltd.; also other seed in the market. For different qualities see p. vii.
Authority for certification	The State Central Seed Control Station.
On open market ?	Yes, also for export if available.

Svalöfs Tidiga Angssvingel
(Svalöf's Early Meadow Fescue)

Origin	Mass-selection in commercial strain.
Authority	Swedish Seed Association, Svalöf, Sweden.
Characteristics	Early, leafy, and high-yielding.
Adaptation	Southern and middle Sweden.
Resistance	Resistant to rust.
Use	Pasture, hay, silage.
Certified ?	Yes.
Grades recognized ?	Original seed sold only by the General Swedish Seed Ltd. ; also other seed in the market. For different qualities see p. vii.
Authority for certification	The State Central Seed Control Station.
On open market ?	Yes, also for export if available.

Festuca rubra :	Creeping red fescue	Aberystwyth S59
Origin	Based on indigenous plants from old pastures and uncultivated situations.	
Authority	Welsh Plant Breeding Station, Aberystwyth, Gt. Britain.	
Characteristics	Leaves long and relatively soft. Individual plants creep widely by means of rhizomes, but turf is not very dense. Winter green if properly managed, but if it becomes rank, herbage is less palatable. Differs from <i>F. rubra</i> var. <i>fallax</i> primarily in its creeping habit, in its greater winter greenness, and greater vigour.	
Adaptation	For grazing in long leys ; not recommended for land of good fertility.	
Use	Not recommended for good land under alternate husbandry, but suitable for uplands and poor re-claimed hill slopes. Popular for lawns and sports grounds. A bottom grass for conditions other than those of the highest fertility.	
Certified ?	Yes.	
Grades recognized ?	Certified.	
Authority for certification	Welsh Plant Breeding Station.	
On open market ?	Yes.	

Festuca rubra :	Creeping red fescue	Duraturf
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Origin	A mass selection out of Swedish material.
Authority	Division of Forage Plants, Central Experimental Farm, Ottawa, Canada.
Characteristics	Upright, about 2 feet in height and comparatively uniform. Has a dense bottom growth with the restricted creeping habit characteristic of the species. Generally does not deviate from the recognized characters for the species.
Adaptation	Adapted to most areas where the species thrives.
Resistance	Considerable drought resistance.
Use	Useful for pasture, but selected mainly for its good turf characteristics. While the creeping habit is restricted as with all other varieties of the same species, the underground stems are strong and vigorous, and consequently new growth originating from them is sturdy and abundant, resulting in a thick, dense sod. The plant remains green even after severe frosts. Combined with Kentucky bluegrass in lawn grass mixtures, this variety has given outstanding results. The variety is a prolific seed producer and because of its uniformity is easily harvested.
Certified ?	Yes, in accordance with the regulations of the Canadian Seed Growers' Association, and the Canada Seeds Act.
Grades recognized ?	Yes, on the basis of purity, germination and disease.
Authority for certification	Canadian Seed Growers' Association, and the Plant Products Division, Department of Agriculture, Ottawa, Ont.
On open market ?	Seed has been produced in limited quantities and should be available in volume in 2 or 3 years.

Festuca rubra :	Red fescue	Refon
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Origin	Selections from introductions from Great Britain.
Authority	Department of Field Husbandry, Ontario Agricultural College, Canada.

Characteristics	Long, creeping, underground rootstalks. Stems are smooth, round and taller than average for species. Leaves are rolled in bud, but the majority unfold later. They are wider and more numerous than in commercial types. Flowers are in a rather erect panicle. Seed similar in size, shape and colour to commercial strains. A hardy, leafy type.
Adaptation	Widely adapted to Ontario conditions.
Resistance	Selected for winter hardiness, drought resistance and resistance to disease.
Use	For pasture, and an ingredient for turf mixtures.
Certified ?	Yes.
Grades recognized ?	Purity of type, freedom from foreign seeds, disease resistant germination and general appearance.
Authority for certification	Plant Products Division, Dominion Department of Agriculture.

Festuca rubra :	Red fescue	Tammisto
Origin	Raised from wild plants in Finland.	
Authority	Plant Breeding Station, Tammisto, Finland.	
Characteristics	Spreads in runners and does not build a sward. The aftermath growth is quick. Development is rather slow, but more rapid than that of <i>Poa pratensis</i> . Of average height.	
Adaptation	Suitable for certain areas from South Finland to Lapland.	
Resistance	Endures winter very well, and is also resistant to smut (<i>Uromyces festucae</i>).	
Use	Very important for pasture.	
On open market ?	Yes, marketed in 1933.	

Festuca rubra :	Red fescue	Golfrood Roodzwenkgras
Authority	Fa D. J. v.d. Have, Wholesale firm, Kapelle Boezelinge, Holland.	
Characteristics	Fine, soft green lawn grass.	
Use	Adapted to lawns on sandy soils.	
Certified ?	Yes.	
Grades recognized ?	No.	
Authority for certification	N.A.K. General Netherlands Inspection Service for Seeds of Field crops, Zoomweg 11, Wageningen.	
On open market ?	Yes.	
Festuca rubra :	Red fescue	Løken
Origin	Produced at the State Experiment Station, Løken, Vollbu, Valdres.	
Authority	[Information supplied by] Dr. H. Wexelsen, Felleskjøpets Stamsaedgård, Vidarshov-Hjellum, Norway.	
Adaptation	Hardy. Selected from material growing at Station situated 1800 ft. above sea level.	
Certified ?	Registered seed produced.	
Festuca rubra :	Red fescue	Reptans
Origin	Selection in collected wild material.	
Authority	Weibullsholm's Plant Breeding Institute, Landskrona, Sweden.	
Characteristics	Broad leaves, good spreading ability.	
Adaptation	All Sweden.	
Resistance	Drought resistant and winter hardy.	
Use	Pasture.	
Certified ?	Yes.	
Grades recognized ?	Original seed sold only by W. Weibull, Ltd., also other seed in the market. For different qualities see p. vii.	

Authority for certification	The State Central Seed Control Station.		
On open market ?	Yes, also for export if available.		
Festuca rubra :	Red fescue	Rex	
Origin	Selection in commercial " spreading Red Fescue ".		
Authority	Algot Holmberg and Sons, Ltd. Norrköping, Sweden.		
Characteristics	Spreading, rather thin sward, broad leaves.		
Adaptation	Every kind of cultivated soil in all Sweden.		
Resistance	Resistant to drought and rust.		
Use	Pasture.		
Certified ?	No.		
Grades recognized ?	No.		
On open market ?	At the present time [1946] not in the market. New multiplication has begun.		
Festuca rubra :	Red fescue	Viking	
Origin	Single plant selection in material from southern Sweden.		
Authority	Swedish Seed Association, Svalöf, Sweden.		
Characteristics	In spring anthocyanin-coloured, good spreading ability.		
Adaptation	All Scandinavia, specially under dry conditions.		
Resistance	Winter hardy and drought resistant.		
Use	Pasture.		
Certified ?	Yes.		
Grades recognized ?	Original seed sold only by the General Swedish Seed Ltd ; also other seed in the market. For different qualities see p. vii.		
Authority for certification	The State Central Seed Control Station.		
On open market ?	Yes, for export only if available.		

Origin	School of Agriculture, Olds, Alberta.
Authority	School of Agriculture, Olds, Alberta, Canada.
Characteristics	Growth habit is erect to spreading, perennial with short root stocks. Few fertile shoots (culms) 35 to 60 cm. tall, oval to round in cross-section accompanied by relatively numerous long-leaved sterile shoots. Leaf-sheaths, lower are reddish brown at base and pubescent; open on fertile shoots but closed on sterile shoots. Blades on fertile shoots (culms) 5-12 cm. long and 2 to 4 mm. wide; on sterile shoots varying up to 30 cm. long and 2 to 4 mm. wide when unrolled; closely folded or V-shaped in cross-section; upper surface ridged and finely pubescent, lower surface smooth and glabrous. Auricles missing or slightly elevated shoulders. Collar pale and smooth to lightly pubescent. Ligule about 0.2 mm. long, truncated, with upper edge finely jagged. Panicle 6 to 15 cm. long, open to contracted and ascending. Branches and upper culm sometimes turn reddish or purplish on ageing. Spikelets—10 to 11 mm. long; 4 to 6 florets; first glume 3 to 5 mm., second glume 4 to 7 mm., lemma 6 to 7 mm. with awn 1 to 2 mm. long.
Adaptation	Suitable for a wide variety of soils, but best in those moderately heavy not sandy.
Resistance	Not subject to diseases. Hardy to temperatures common throughout western Canada. Is moderately drought resistant. Well established stands are winter hardy.
Use	Lawns, fairways, pastures, soil conservation.
Certified ?	Yes.
Grades recognized ?	Accepted by Canadian Seed Growers' Association for registration. Registered and certified seed is produced.
Authority for certification	Registered seed—Canadian Seed Growers' Association. Certified seed—Plant Products Division, Production Service, Dominion Department of Agriculture.
On open market ?	Yes.

Origin	Chewings' fescue (<i>Festuca rubra</i> var. <i>fallax</i>) is the only representative of the genus used extensively in New Zealand. It plays a small role on high rainfall hill country and as a successional species on short rotational soil types in particular parts of Southland where seed is produced on a large scale.
Characteristics	Dense, fine-leaved foliage : turf-forming.
Adaptation	Wide soil and climatic range, persistent and mat forming under dry or wet, low soil fertility conditions. Appears peculiarly sensitive to climatic environment in regard to seed production.
Resistance	Relatively free from diseases.
Use	For pastures on low fertility hill country soil types and for fine playing greens, lawns and aerodromes.
Grades recognized ?	N.Z. Chewings fescue—uncertified.
Authority for certification	None. Certification at present considered unnecessary owing to type-purity and distinctive seed characteristic. Later kiln-dried seed may be certified.
On open market ?	Commercially available. Seed short-lived under normal humidity conditions and susceptible to germination loss in transit unless pre-dried or shipped in cold storage.

Glycine hispida :	Soybean	A.K. (Harrow)
Origin	Seed was obtained from the U.S. Dept. Agric. in 1924. From this varietal mixture the present pure line was obtained through continuous selection and roguing.	
Authority	The Dominion Experimental Station, Harrow, Ontario, Canada.	
Characteristics	Erect, tall-growing plant having few branches which are usually borne fairly close to the main stem. Pubescence, light grey. Flower white. Average height, 46—48 in. when grown in 30 in. rows. Maturity late in south-western Ontario. Seed coat yellow, hilum brown, seed size small, about 3000 per lb.	
Adaptation	Being late maturing is adapted only to the extreme south-western portion of Ontario, mainly Essex County. In its adapted district it is the most extensively grown variety because of its high yields.	
Resistance	No particular disease resistance.	
Use	Grown mainly for beans but the large type of plant favours use as a hay crop or green manure in districts with somewhat shorter growing seasons.	
Certified ?	Yes, in accordance with the regulations of the Canadian Seed Growers' Association and the Canada Seeds Act.	
Grades recognized ?	Yes; on the basis of genetic purity, germination and disease. Official grades are: Registered No. 1, No. 2, No. 3: Commercial No. 1, No. 2, No. 3.	
Authority for certification	Canadian Seed Growers' Association and Plant Products Division, Dominion Department of Agriculture.	
On open market ?	A good supply of seed both registered and commercial is available.	

Glycina hispida :	Soybean	Capital
Origin	Developed from a single plant progeny obtained from a cross made in 1935 between Strain 171 × A.K. (Harrow). Strain 171 was a selection obtained from	

a mixed lot of seed received by the Division of Forage Plants in 1931, and which had been collected in the vicinity of Sochentze, east of Harbin, Manchuria.

Authority	Division of Forage Plants, Central Experimental Farm, Ottawa, Ontario, Canada.
Characteristics	Erect, bushy habit of growth with stems and leaves of medium size. Good strength of stalk. Pubescence tawny (brown), purple flowers. Average height, 33—39 in. Leaves are shed just previous to seed maturity. Matures in 120 to 125 days (at Ottawa). Seedcoat, yellow. Hilum, very light brown, dark spot at micropyle. Cotyledons, yellow. Seed size medium to small (1000 seeds weight, 140 to 155 grm.).
Adaptation	Capital is among the medium maturing varieties. Being a new variety, it has not been grown widely as yet, but it is expected to have a wide adaptation in Ontario, and a limited adaptation in Quebec. It should also be adapted to some areas of British Columbia.
Resistance	Highly resistant to bacterial blight.
Use	Principally for the production of beans, but may be used for hay and for silage in combination with corn. May also be ploughed under as green manure.
Certified ?	Yes, in accordance with the regulations of the Canadian Seed Growers' Association, and the Canada Seeds Act.
Grades recognized ?	Yes, on the basis of pedigree purity, germination and disease resistance. Official grades are : Registered No. 1, No. 2, No. 3 : Commercial No. 1, No. 2, No. 3.
Authority for certification	Canadian Seed Growers' Association and the Plant Products Division, Dominion Department of Agriculture.
On open market ?	Not at present. Only available seed is a limited amount of Foundation stock now in the process of multiplication by the Division of Forage Plants, Central Experimental Farm, Ottawa, for distribution to growers.

Glycine hispida :	Soybean	Goldsoy
Origin	Single plants selection from O.A.C. No. 211.	
Authority	Department of Field Husbandry, Ontario Agricultural College, Canada.	
Characteristics	Stems of medium height, bushy. Leaf large, moderately tapering. Purple flower. Large, oval, yellow seed.	
Adaptation	Early ; widely adapted for Ontario.	
Resistance	Not subject to disease in Ontario.	
Use	Recommended for grain production.	
Certified ?	Yes.	
Grades recognized ?	Seed is graded on purity and germination.	
Authority for certification	Plant Products Division Dominion, Department of Agriculture.	
Glycine hispida :	Soybean	Harman
Origin	Developed from a single plant selection made from a mixed lot of seed collected from Hailin east of Harbin in Manchuria. Preliminary selections were made by the Division of Forage Plants, Central Experimental Farm, Ottawa, and sent to the Dominion Experimental Station, Harrow, in 1933. Subsequent plant progeny selections were made at Harrow until 1936.	
Authority	Division of Forage Plants, Central Experimental Farm, Ottawa, Ontario, Canada.	
Characteristics	Normally quite erect growth with branches held fairly close to the main stem. Height about 38 in. when grown in 30-inch rows. Pubescence, brown ; flowers, purple. Medium maturity about 6 days earlier than A.K. (Harrow). Seedcoat yellow ; hilum, black ; size, medium ; about 2960 per pound ; shape ovoid and somewhat flattened.	
Adaptation	May be classed as a medium maturing variety for south-western Ontario. Being a new variety, the area of adaptation has not been definitely determined but it should mature satisfactorily in Essex and Kent Counties.	
Resistance	No particular resistance noted to date.	
Use	For either beans or hay. Use of soybeans for hay in south-western Ontario is very limited, therefore recommendations are made practically entirely on a bean basis.	
Certified ?	Yes, in accordance with the regulations of the Canadian Seed Growers' Association and the Canada Seeds Act.	

Grades recognized ?	Yes, on the basis of genetic purity, germination and disease. Official grades are: Registered No. 1, No. 2, No. 3. Commercial No. 1, No. 2, No. 3.
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Authority for certification	Canadian Seed Growers' Association and Plant Products Division, Dominion Department of Agriculture.
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On open market ?	Yes. A small amount of registered seed has been distributed from the 1944 crop. A good supply will be available from the 1945 crop.
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Glycine hispida :	Soybean	Kabott
Origin	Obtained by selection from a mixed lot of seed collected in the area of Ninguta, Manchuria, and received in 1933 through Mr. Kabalkin, London, England.	

Authority	Division of Forage Plants, Central Experimental Farm, Ottawa, Ontario, Canada.
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Characteristics	Erect, bushy habit of growth, with stems and leaves of medium size. Pubescence, grey, purple flower, pod buff yellow (at maturity). Average height 27-33 in. Leaves are shed just previous to seed maturity. Matures 110 to 115 days (at Ottawa). Seedcoat, hilum and cotyledon, yellow; seed size medium (1000 seeds weight, 175-185 gm.).
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Adaptation	An early variety; has been matured in practically every province of Canada. Best adapted to areas in Ontario, Quebec, Manitoba, Alberta and British Columbia.
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Resistance	Slight susceptibility to bacterial blight.
Use	For the production of mature beans; but may also be used for hay or for ploughing under as green manure. Beans also used in the green stage as a vegetable.

Certified ?	Yes, in accordance with the regulations of the Canadian Seed Growers' Association and the Canada Seeds Act.
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Grades recognized ?	Yes, on the basis of pedigree purity, germination and disease. Official grades are:—Registered No. 1; No. 2; No. 3. Commercial No. 1; No. 2; No. 3.
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Authority for certification	Canadian Seed Growers' Association, and the Plant Products Division, Dominion Department of Agriculture.
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On open market ?	Yes, good supplies of registered and commercial grades of seed are available.
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Glycine hispida :	Soybean	Mandarin (Ottawa)
Origin	Obtained by single plant selection conducted during 1925-1934, within seed of Mandarin received from the U.S.D.A., Washington, D.C. Selection work was begun at the Dominion Experimental Station, Harrow, Ont. (1925 to 1929), and continued at the Central Experimental Farm, Ottawa, Ont. (1929 to 1934).	
Authority	Division of Forage Plants, Central Experimental Farm, Ottawa, Ontario, Canada.	
Characteristics	Erect, bushy habit of growth, with stems and leaves of medium size. Pubescence, grey ; purple flowers ; deep buff yellow pod (at maturity) ; dull green leaves. Average height, 27-33 in. Leaves are shed just previous to seed maturity. Matures 120-125 days (at Ottawa). Seedcoat, hilum, and cotyledons, yellow ; seed size, medium to large (1000 seeds weight, 190-200 grm.).	
Adaptation	Among the medium maturing varieties. Has a wide adaptation in Ontario, but limited in Quebec. Under favourable conditions it matures in areas of British Columbia.	
Resistance	Highly resistant to bacterial blight.	
Use	Principally for bean production, but also used to some extent for hay and for silage in combination with corn. May be ploughed under as green manure.	
Certified ?	Yes, in accordance with the regulations of the Canadian Seed Growers' Association and the Canada Seeds Act.	
Grades recognized ?	Yes, on the basis of pedigree, purity, germination and disease. Official grades are :—Registered No. 1 ; No. 2 ; No. 3. Commercial No. 1 ; No. 2 ; No. 3.	
Authority for certification	Canadian Seed Growers' Association, and the Plant Products Division, Dominion Department of Agriculture.	
On open market ?	Yes, good supplies of registered and commercial grades of seed are available.	
Glycine hispida :	Soybean	Manitoba Brown
Origin	From seed obtained presumably from the U.S. Dept. Agric. about 1922. Selection for earliness and	

yield made until variety introduced and distributed.

Authority [Information supplied by] Faculty of Agriculture,
Univ. Manitoba, Canada.

Characteristics A rather low-growing bush type carrying pods rather
close to the ground. Seed grown, medium to large.

Adaptation Early maturing, adapted for short season areas such
as southern Manitoba. Will mature in all except
decidedly unfavourable seasons in that area.

Use A good producer for a variety of the earliness range
that it represents. Early maturity its outstanding
feature. Disadvantages are the brown seed coat
which is objectionable to the trade; tendency for
the pods to be borne close to the ground, and ten-
dency to shatter.

Certified? Yes.

On open market? Yes.

Glycine hispida : **Soybean** **O.A.C. No. 211**
Origin Selection from Habaro, which was introduced from
Siberia in 1906 by the U.S. Dept. Agric.

Authority Department of Field Husbandry, Ontario Agri-
cultural College, Canada.

Characteristics Medium height, plant bushy. Large, moderately
tapering leaves. Purple flowers. Large, oval,
yellow seed.

Adaptation Maturity mid-seasonal. Adapted for seed production
in south-western Ontario and for hay in Central
Counties.

Resistance Not subject to disease in Ontario.

Use High oil content and high protein.

Certified? Yes.

Grades
recognized? Seed is graded on purity and germination.

Authority for
certification Plant Products Division, Dominion Department of
Agriculture.

Glycine hispida :**Soybean****Pagoda**

Origin	Developed from a single plant progeny obtained from a cross made in 1930 between the varieties Manitoba Brown and Mandarin (Ottawa).
Authority	Division of Forage Plants, Central Experimental Farm, Ottawa, Ontario, Canada.
Characteristics	Erect, bushy habit, with stems and leaves of medium size. Pubescence, grey, purple flowers. Buff yellow pod (at maturity). Average height, 24-30 in. Leaves are shed just previous to seed maturity. Matures—100 to 105 days (at Ottawa). Seedcoat, hilum and cotyledons, yellow. Seed size medium (1000 seeds weight, 175 to 185 gm.).
Adaptation	Among the earliest of soybean varieties and has been matured in all provinces of Canada. Adapted to areas in Ontario, Quebec, Manitoba, Alberta and British Columbia.
Resistance	Moderately susceptible to bacterial blight.
Use	For production of mature beans, and for hay or ploughing under as green manure.
Certified ?	Yes, in accordance with the regulations of the Canadian Seed Growers Association and the Canada Seeds Act.
Grades officially recognized ?	Yes, on the basis of pedigree, purity germination and disease. Official grades are : Registered, No. 1 ; No. 2 ; No. 3. Commercial No. 1 ; No. 2 ; No. 3.
Authority for certification	Canadian Seed Growers' Association, and the Plant Products Division, Dominion Department of Agriculture.
On open market ?	Yes, limited quantities of registered and commercial grades of seed are available.

Glycine hispida :**Soybean****36.S.58**

Origin	From a cross between Potchefstroom 449 and the American variety Dixie.
Authority	[Information supplied by] Dr. A. R. Saunders, South Africa.

Helianthus annuus :	Sunflower	Sunrise
Origin	The increased progenies of third generation inbred lines descending from selections made out of early Saratov N-249.	
Authority	The Dominion Forage Crops Laboratory, Saskatoon, Sask., Canada.	
Characteristics	Plant semi-dwarf, 3-4 ft. high. Kernels small, 50-70 grm. per 1000 seeds. Seeds well filled and heavy. Percentage kernel high, 55-62. Percentage oil in seeds, basis unhulled seed, 28-35. Considerable variation in plant type, particularly with respect to branching. Most plants branch from base only, but a few produce branches throughout full length of stem. In early maturing group.	
Adaptation	Adapted to production in areas of relatively short growing season. Produces well under limited soil moisture, but responds to more favourable moisture conditions.	
Resistance	Has considerable resistance to sunflower moth— <i>Homoeosoma electellum</i> .	
Use	Chiefly an oil-seed crop.	
Certified ?	Yes, registered and commercial grades of seed are available in commercial quantities.	

Hordeum vulgare :	Barley	Acre Earliest
Origin	Palestine.	
Authority	Agricultural Station, Acre, Palestine.	
Characteristics	Very early and rapid growth. Yields 1.5 to 2 tons per annum.	
Adaptation	Adapted to all Palestine. Winter crop. Without irrigation.	
Use	Soilage, pasture.	
Certified ?	No.	
Grades recognized ?	No.	
Authority for certification	Seed Committee : (a semi-official body consisting of representatives of the Dept. Agric., of the Jewish	

Agency, of the Field Crop Growers' Assoc., and of, "Hazera" Seed Producers' Co-operative).

On open market ? Yes.

Hordeum hexastichum :	Winter Barley	Bore
Origin	Out of the cross Mansholt's Winter Barley $\times$ Pommer Nordland Winter Barley.	
Authority	Swedish Seed Association, Svalöf, Sweden.	
Characteristics	Six-rowed, β -type. Good winter hardiness.	
Adapatation	Winter barley for southern Sweden.	
Use	Fodder.	
Certified ?	Yes.	
Grades recognized ?	Original seed sold only by the General Swedish Seed Ltd., Svalöf. Also other seed on the market. For different qualities see page vii.	
Authority for certification	The State Central Seed Control Station.	
On open market ?	Yes, also for export.	

Hordeum hexastichum :	Barley	Brio
Origin	Pure line selection of a six-rowed local variety from Scania.	
Authority	Swedish Seed Association, Svalöf, Sweden.	
Characteristics	Six-rowed, δ -type.	
Adaptation	Southern Sweden, especially on sandy soils.	
Use	Fodder.	
Certified ?	Yes.	
Grades recognized ?	Original seed sold only by the General Swedish Seed Svalöf. Also other seed on the market. For different qualities see page vii.	
Authority for certification	The State Central Seed Control Station.	
On open market ?	Yes, also for export.	

Hordeum hexastichum :	Barley	Dore
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Origin	Pure line selection in a local variety of six-rowed barley from Jämtland.
Authority	Swedish Seed Association, Jämtland Branch Station, Ås, Sweden.
Characteristics	Six-rowed, δ -type. Very early ripening.
Adaptation	Central and Northern Norrland, especially the interior, and on basic soils.
Use	Fodder and in certain amount for bread.
Certified ?	Yes.
Grades recognized ?	Original seed sold only by the General Swedish Seed Ltd., Svalöf. Also other seed on the market. For different qualities see page vii.
Authority for certification	The State Central Seed Control Station.
On open market ?	Yes, also for export.

Hordeum hexastichum :	Barley	Edda
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Origin	Out of the cross Asplund $\times$ Vega.
Authority	Swedish Seed Association, Jämtland Branch Station, Ås, Sweden.
Characteristics	Six-rowed, δ -type, high yield, stiff straw. Early ripening.
Adaptation	Central and Southern Norrland.
Use	Fodder and in certain amount for bread.
Certified ?	Yes.
Grades recognized ?	Original seed sold only by the General Swedish Seed Ltd., Svalöf. Also other seed on the market. For different qualities see page vii.
Authority for certification	The State Central Seed Control Station.
On open market ?	Yes, also for export.

Hordeum hexastichum :	Barley	Stella
Origin	Pure line selection in local variety of six-rowed barley from southern Norrland.	
Authority	Swedish Seed Association. Västernorrland Branch Station, Undrom, Sweden.	
Characteristics	Six-rowed, β -type. Early ripening.	
Adaptation	Southern coastal Norrland.	
Use	Fodder and as diastase producer for the breweries.	
Certified ?	Yes.	
Grades recognized ?	Original seed sold only by the General Swedish Seed Ltd., Svalöf. Also other seed on the market. For different qualities see page vii.	
Authority for certification	The State Central Seed Control Station.	
On open market ?	Yes, also for export.	

Hordeum hexastichum :	Barley	Vega
Origin	Pure line selection in a local variety of six-rowed barley from Norrland.	
Authority	Swedish Seed Association, Upper Norrland Branch Station, Luleå, Sweden.	
Characteristics	Six-rowed, δ -type. Early ripening.	
Adaptation	Central and Northern Norrland.	
Use	Fodder and in certain amount for bread.	
Certified ?	Yes.	
Grades recognized ?	Original seed sold only by the General Swedish Seed Ltd., Svalöf. Also other seed on the market. For different qualities see page vii.	
Authority for certification.	The State Central Seed Control Station.	
On open market ?	Yes, also for export.	

Hordeum vulgare :	Barley	Brage
Origin	Pure line selection of Chevalier.	
Authority	Swedish Seed Association, Svalöf, Sweden.	
Characteristics	Two-rowed, nutans, δ -type. Tall. Ripening comparatively late.	
Adaptation	Southern and middle Sweden.	
Resistance	Resistant to nematodes.	
Use	Fodder and for breweries. Recommended for mixed crops.	
Certified ?	Yes.	
Grades recognized ?	Original seed sold only by the General Swedish Ltd., Svalöf. Also other seed in the market. For different qualities see page vii.	
Authority for certification	The State Central Seed Control Station.	
On open market ?	Yes, also for export.	

Hordeum vulgare :	Barley	Freja
Origin	Out of the cross Segar $\times$ Opal.	
Authority	Swedish Seed Association, Svalöf, Sweden.	
Characteristics	Two-rowed, nutans, β -type, high yield. Straw stiff. Fairly good malting quality.	
Adaptation	Southern and middle Sweden.	
Use	Fodder and for breweries.	
Certified ?	Yes.	
Grades recognized ?	Original seed sold only by the General Swedish Seed Ltd., Svalöf. Also other seed in the market. For different qualities see page vii.	
Authority for certification	The State Central Seed Control Station.	
On open market ?	Yes, also for export.	

Hordeum vulgare :	Barley	Opal B
Origin	Pure line selection of the Danish variety Opal (Binder $\times$ Gull).	
Authority	Swedish Seed Association, Svalöf, Sweden.	
Characteristics	Two-rowed, nutans, β -type. Good malting quality.	
Adaptation	Southern Sweden.	
Use	Fodder and for breweries.	
Certified ?	Yes.	
Grades recognized ?	Not sold as "original seed". For other qualities see page vii.	
Authority for certification	The State Central Seed Control Station.	
On open market ?	Yes, also for export.	

Hordeum vulgare :	Barley	Primus II
Origin	Out of the cross Gull $\times$ Primus I (of Swedish Plumage).	
Authority	Swedish Seed Association, Ultuna Branch Station, Uppsala, Sweden.	
Characteristics	Two-rowed, erectum, γ -type.	
Adaptation	Central Sweden.	
Use	Fodder and for breweries.	
Certified ?	Yes.	
Grades recognized ?	Original seed sold only by the General Swedish Seed Ltd., Svalöf. Also other seed on the market. For different qualities see page vii.	
Authority for certification	The State Central Seed Control Station.	
On open market ?	Yes, also for export.	

Hordeum vulgare :	Barley	Stallar
Origin	Out of the cross (Local Variety $\times$ Gull) $\times$ Maja.	
Authority	Weibullsholm Plant Breeding Institution, Landskrona, Sweden.	
Characteristics	Two-rowed. Long and stiff straw. High yielding.	
Adaptation	Southern and middle Sweden.	
Use	Fodder and for breweries. Especially recommended for mixed crops.	
Certified ?	Yes.	
Grades recognized ?	Original seed sold only by W. Weibull Ltd., Landskrona. Also other seed on the market. For different qualities see page vii.	
Authority for certification	The State Central Seed Control Station.	
On open market ?	Yes, also for export.	

Hordeum vulgare :	Barley	Svanhals
Origin	Pure line selection of the German variety Diamant.	
Authority	Swedish Seed Association, Svalöf, Sweden.	
Characteristics	Two-rowed, erectum, α -type. The oldest Svalöf variety in the present assortment (marketed in 1899).	
Adaptation	Central Sweden.	
Use	Fodder and for the breweries.	
Certified ?	Yes.	
Grades recognized ?	Original seed sold only by the General Swedish Seed Ltd., Svalöf. Also other seed on the market. For different qualities see page vii.	
Authority for certification	The State Central Seed Control Station.	
On open market ?	Yes, also for export.	

Hordeum vulgare :	Barley	Ymer
Origin	Out of the cross Maja $\times$ (Segar $\times$ Opal).	
Authority	Swedish Seed Association, Svalöf, Sweden.	

Characteristics	Two-rowed, nutans, mainly α -type (partly β). Straw-stiff. Fairly good malting quality. Very high yield.		
Adaptation	Southern and middle Sweden.		
Use	Fodder and for the breweries.		
Certified ?	Yes.		
Grades recognized ?	Original seed sold only by the General Swedish Seed Ltd., Svalöf. Also other seed in the market. For qualities see page vii.		
Authority for certification	The State Central Seed Control Station.		
On open market ?	Yes, also for export.		
Lathyrus sativus :	Field peas	Unnamed	
Origin	Punjab.		
Authority	Fodder Specialist, Sirsa, India.		
Characteristics	Annual winter fodder crop, mostly grown in riverain lands. Stem is usually angular and does not remain straight without support. Leaves are composed of 2 or 3 pairs of opposite leaflets together with one or more pairs of tendrils. Leaflets usually ovate. Stipules fairly large. Flower is bluish-purple. Pods are green when unripe and pale yellow when ripe. Seeds are almost as big as cowpeas, but usually flattened on all sides. The seeds are greyish brown with fine spots.		
Adaptation	Grown during October and November under irrigated conditions or in the riverain areas. Loam or light soils are suitable.		
Resistance	No serious pest or disease has so far been noticed damaging this crop. It is fairly drought resistant.		
Use	Can be cut and fed green or the standing crop can be pastured. Not fit for silage but can be turned into hay under mild climatic conditions.		
Certified ?	Yes.		
Grades recognized?	No.		
Authority for certification	Department of Agriculture, Punjab.		

Lolium sp. :	Wimmera ryegrass	Unnamed
Origin	Selection.	
Authority	Department of Agriculture, Western Australia.	
Characteristics	Early maturing, erect type.	
Adaptation	Adapted to very short growing season.	
On open market ?	Seed is now being multiplied.	

Lolium italicum :	Italian ryegrass	Sceempter Italiaansch raaigrass
Origin	—	
Authority	N. V. Zwaan en de Wiljes, Wholesale firm, Sceempter, Holland.	
Characteristics	Rapid development, good yield and aftermath.	
Resistance	Not resistant to frost.	
Use	Suited for leys for grazing, during 1 or 2 years.	
Certified ?	Yes.	
Grades recognized ?	No.	
Authority for certification	N.A.K. General Netherlands Inspection Service for Seeds of Field crops, Zoomweg 11, Wageningen.	
On open market ?	Yes.	

Lolium italicum westerwoldicum :	Westerwoldicum ryegrass	Westerwoldsch raaigras CB.
Origin	—	
Authority	Central Bureau. Farmer's Co-operation, Rotterdam, Holland.	
Characteristics	Rapid development, rich foliage, good aftermath.	
Resistance	Not resistant to frost.	
Use	Suited for 1-year leys for hay.	
Certified ?	Yes.	

Lolium multiflorum var. : **Western Wolths Ryegrass** **See note
on page vi**

Origin	Breeding from N.Z. and overseas ecotypes including hybridization with bred strains of Italian ryegrass.
Authority	Grasslands Division, Plant Res. Bureau, Dept. Sci. Ind. Res., New Zealand.
Characteristics	Erect, broad leaf, quickly establishing with high winter productivity.
Adaptation	Wide soil and climatic range in any arable and short ley system of agriculture.
Resistance	Relatively free from diseases.
Use	Essentially a 1-year ley and specifically for high winter production : for cover crop or soiling crop.
Grades recognized ?	As for Italian ryegrass when available.
Authority for certification	N.Z. Department of Agriculture when commercial seed stocks are available.
On open market ?	Nucleus pedigree stocks only, at present.

Lolium multiflorum : **Italian ryegrass** **Imperial**

Origin	Selection in Weibull's Purebred Italian Ryegrass.
Authority	Weibullsholm's Plant Breeding Institute, Land-skrona, Sweden.
Adaptation	Southern Sweden.
Use	Hay.
Certified ?	Yes.
Grades recognized ?	Original seed sold only by W. Weibull Ltd. ; also other seed in the market. For different qualities see p. vii.
Authority for certification	The State Central Seed Control Station.
On open market ?	Yes, also for export if available.

Lolium perenne :	Perennial ryegrass	Victorian perennial
Origin	Natural selection in old swards.	
Authority	Dept. Agric., Victoria, Australia.	
Characteristics	Conforms to perennial ryegrass type.	
Adaptation	Is quasi-indigenous in zones of rich basaltic land in central and western districts of Victoria, represented mainly by the townships of Clunes, Kyneton and Colac. These areas annually receive 20-30 in. of rainfall.	
Resistance	Is hardy, mainly in ability to withstand a period of several dry hot summer months. Able to make good growth in late autumn and early spring but usually summer growth is limited by dryness.	
Use	Forms a basic element in many pasture mixtures in the winter rainfall zone of Australia, south of latitude 30°S. and 43°S. but only where the annual rainfall exceeds 22 to 25 in. or the pasture is irrigated. It is often preferred to imported strains because of its superior autumn and spring growth.	
Certified ?	Yes, under Government schemes, on the basis of locality and history.	
Grades recognized ?	Provision is made for the certification of "mother" seed, but there is no official recognition of other grades.	
Authority for certification	The Victorian Department of Agriculture.	
On open market ?	Yes, and it has been exported but supply is irregular and the local demand for perennial ryegrass usually absorbs all that is produced.	

Lolium perenne :	Perennial ryegrass	Peron
Origin	Selections from introductions from Scandinavia and Great Britain.	
Authority	Department of Field Husbandry, Ontario Agricultural College, Canada.	
Characteristics	Stems are smooth, slender and similar in size to commercial strains. Leaves are dark green, folded in the bud and more numerous than in the commercial strains. Flowers have characteristic flattened spikelets arranged in two rows, and are borne edge-ways to the rachis. Seed is similar in size, shape and colour to that of commercial strains. Distinctly hardier than commercial strains.	
Adaptation	For milder and more humid areas of central and southern Ontario.	
Resistance	Selected for disease resistance and hardiness.	
Use	Nurse crop for pasture mixtures, and an ingredient in short term hay-pasture mixtures.	
Certified ?	Yes.	
Grades recognized ?	Purity of type, freedom from foreign seeds, disease resistance, germination and general appearance.	
Authority for certification	Plant Products Division, Dominion Department of Agriculture.	
Lolium perenne :	Perennial ryegrass	Pacific
Origin	Russian material—introduced (1928) by Division of Forage Plants, Ottawa.	
Authority	Division of Forage Plants, Ottawa, and Experimental Farm, Agassiz, British Columbia, Canada.	
Characteristics	Dense, leafy, broad clumps, commences growth very early. High proportion of leaf to stem. Leaves numerous, lax, length and width variable, dark green, smooth and glossy below, dull and distinctly ribbed above. Length of culms 24-34 in., smooth, semi-upright, numerous. Spikes semi-erect, closely compressed. Average length, 15 cm. Seed moderately flattened, approximate average length 6.5 mm. The variety is persistent and recovers rapidly after cutting. It produces an abundant yield of seed, maturing about mid-July under Agassiz conditions.	

Adaptation	Adapted to wide range of soils, highest yields produced on clays and clay loams, well supplied with moisture. Climatic adaptation relatively narrow. Annual precipitation should be more than 30 in. and severe winter temperatures should be avoided. Readily becomes dormant under severe heat and prolonged drought. Confined to areas possessing mild coastal climate.
Resistance	Moderately susceptible to leaf rust.
Use	Primarily a pasture species or for artificially dried fodder. Useful as a constituent in mixtures for hay or silage.
Certified ?	Yes.
Grades recognized ?	Yes ; on basis of genetic constitution, disease resistance, germination and general appearance.
Authority for certification	Canadian Seed Growers' Association and Dominion Department of Agriculture.

Lolium perenne : **Perennial ryegrass** **Aberystwyth S23**
Origin Based on material obtained from old grazed pastures (Midlands, Kent, Lincolnshire, Wales and Holland).

Authority	Welsh Plant Breeding Station, Aberystwyth, Gt. Britain.
Characteristics	Spreading growth, late flowering habit ; high tillering, dense, leafy. Very persistent under grazing.
Adaptation	May be the best bottom grass for fertile lands. Persistent even in relatively poor soils where rainfall adequate.
Use	Should be included in all grazing mixtures. Blends perfectly with S100 or S184 <i>T. repens</i> ; in conjunction with S100 is best for producing late autumn keep.
Certified ?	Yes.
Grades recognized ?	Certified.
Authority for certification	Welsh Plant Breeding Station.
On open market ?	Yes.

Lolium perenne :	Perennial ryegrass	Aberystwyth S24
Origin	Based primarily on two wild plants, but <i>not</i> from an old grazed pasture. These two plants have been interbred and further " native " basic plant material has been added. Also some plants from the produce of Hawkes' Bay (N.Z.) seed have been selected and incorporated in the strain.	
Authority	Welsh Plant Breeding Station, Aberystwyth, Gt. Britain.	
Characteristics	Is slightly earlier and more abundant in spring growth, but flowers very slightly later than Irish and Ayrshire. Produces bulky hay, and recovery in aftermath is better than in other two types. There are few flowering stems in aftermath. Seed yields only slightly lower than in ordinary Irish.	
Adaptation	For heavy land and fertile loams.	
Use	Should be included in leys of short duration and consist of up to 50 per cent of the mixture.	
Certified ?	Yes.	
Grades recognized ?	Certified.	
Authority for certification	Ministry of Agriculture, Northern Ireland.	
On open market ?	Yes.	
Lolium perenne :	Perennial ryegrass	Aberystwyth S101
Origin	Based entirely on plants derived from very old pastures of the Midlands and Kent.	
Authority	Welsh Plant Breeding Station, Aberystwyth, Gt. Britain.	
Characteristics	Flowers only slightly earlier than S23, and plants are less spreading ; leaf blades longer and often broader. Thus the plants approach a hay type ; is a leafy, dual-purpose strain.	
Adaptation	Persistent under good conditions. Responds to N manures if soil is well limed and given phosphates and potash.	

Use Should be included in all ryegrass mixtures of over 2 years' duration, and up to 33 per cent of it can be included in ryegrass grazing mixtures. Less suitable than S23 for hard grazing on soils of relatively poor fertility. Blends well with S100 *Trifolium repens*.

Certified ? Yes.

Grades
 recognized ? Certified.

Authority for
 certification Welsh Plant Breeding Station.

On open market ? Yes.

Lolium perenne :	Perennial ryegrass	Ayrshire Perennial
Origin	Certain stocks have always been grown in Ayrshire. The first known instance of seed being saved and cleaned was by Peter Connor of Stair in 1815. He bought from farmers loft sweepings and had such good demand for them that he persuaded some farmers to grow ryegrass expressly for saving the seed.	

Authority [Information supplied by] Messrs. McGill and Smith, Ayr, Gt. Britain.

Characteristics Variable population, which matures early, and seeds heavily.

Adaptation Long-established centre of production in Ayrshire (between lat. 56-57°N.). Estimated accumulated temperature, April to September inclusive, 1700 to 1900 day degrees F. Mean annual rainfall 36-49 in. Seed crops grown from about sea-level to 700 feet.

Resistance The climate in Ayrshire suitable for seed production is found in the Maybole, Coylton, Stair, Tarbolton and Craigie districts.

Use Used for both pasture and hay.

Certified ? No scheme operates.

On open market ? The quantity of seed available to-day is less than one-third of that available in 1920. All the production could be absorbed by the home market.

Lolium perenne :	Perennial ryegrass	Golden
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Origin	Originally developed from a plant growing in a farmer's field by the late Dr. D. G. O'Brien of West of Scotland Coll. Agric.
Authority	[Information supplied by] Messrs. McGill and Smith, Ayr, Gt. Britain.
Characteristics	An early strain, more leafy and with weaker straw than Ayrshire Perennial. The original stocks had a high proportion of reddish purple colouring, but later stocks are 90 per cent golden. They have no colour in the root stalk, and seed heads are golden yellow instead of typical purple appearance of Ayrshire Perennial. Seed produced is not as much as in Ayrshire Perennial. The lack of red colour in leaf bases and root stalks is of trade value in that it distinguishes mixtures.
Resistance	Not specially resistant to disease, pest or climatic conditions.
Use	Early leafy type for inclusion in pasture mixtures.
Certified ?	Certain stocks are certified.
Authority for certification	Certain newer stocks are officially certified by the Dept. Agric., Scotland, as being distinct from Ayrshire Perennial.
On open market ?	Quantity of newer stocks is limited, but they are being rapidly multiplied and should soon be available in quantity.

Lolium perenne :	Perennial ryegrass	Engelsch raaigras hooitype CB.
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Origin	Selected from pastures.
Authority	Central Bureau, Farmer's Co-operation, Rotterdam, Holland.
Characteristics	Rapid development, rich foliage.
Adaptation	Suited for all, except too dry soils.
Resistance	Not resistant to excessive drought and frost.
Use	Suited for hay and leys during 2 or more years.

Certified ?	Yes.
Grades recognized ?	No.
Authority for certification	N.A.K. General Netherlands Inspection Service for Seeds of Field crops, Zoomweg 11, Wageningen.
On open market ?	Yes.

Lolium perenne :	Perennial ryegrass	Engelsch raaigras Weide- type CB.
Origin	Selected from old pastures.	
Authority	Central Bureau, Farmer's Co-operation, Rotterdam, Holland.	
Characteristics	Rich foliage, late in flowering, persistent during many years, good tillering capacity.	
Adaptation	Suited for all soils, except very dry.	
Resistance	Not resistant to drought and frost.	
Use	Suited for permanent pastures.	
Certified ?	Yes.	
Grades recognized ?	No.	
Authority for certification	N.A.K. General Netherlands Inspection Service for Seeds of Field crops, Zoomweg 11, Wageningen.	
On open market ?	Yes.	

Lolium perenne :	Perennial ryegrass	See note on page vi
Origin	Breeding from tested ecotypes mainly of N.Z. origin. Permanent pasture grade also includes seed of tested natural ecotype.	
Authority	Grasslands Division, Plant Res. Bureau, Dept. Sci. Ind. Res., New Zealand.	
Characteristics	Perennial, tufted, leafy, dense tillered, good swarding propensities.	
Adaptation	Mesophytic and temperate climate, high soil fertility demanded, particularly in regard to supply of nitrogen. Grazing rather than hay or silage. Susceptible to shade.	
Resistance	Bred strains are resistant to leaf rust (<i>Puccinia coronata</i>). All strains are susceptible to ergot (<i>Claviceps purpurea</i>) and blind seed disease (<i>Phialea temulenta</i>).	
Use	Pasture, hay or silage under short rotation, long rotation and permanent pasture. Dairying, fat lamb and cattle.	
Grades recognized ?	N.Z. Certified pedigree. " " Mother seed. " " permanent pasture. " Uncertified.	
Authority for certification	N.Z. Department of Agriculture.	
On open market ?	Seed stocks of all grades are commercially available.	

The genus *Lolium* provides the more important grasses for fat lamb and milk production in New Zealand. Within the genus strains have been developed that cover a wide range of agronomic use. These cover truly permanent grassland, long-rotation grassland, short rotation grassland, temporary pastures and annual leys. Hybridization within the genus promises to play an important part in adaptation of the genus to varying types of land use, and the possibilities in this direction are wide and varied. The species and strains are now either in commerce or are in varying stages of production.

Lolium perenne :	Perennial ryegrass	Viktoria
Origin	Single plant selection in wild-growing material from southern Sweden.	
Authority	Swedish Seed Association, Svalöf, Sweden.	
Characteristics	Late, very leafy.	

Adaptation	Southern and middle Sweden.
Resistance	Very winter hardy and persistent.
Use	Hay, pasture, silage, artificially dried fodder.
Certified ?	Yes.
Grades recognized ?	Original seed sold only by the General Swedish Seed Ltd.; also other seed in the market. For different qualities see page vii.
Authority for certification	The State Central Seed Control Station.
On open market ?	Yes, also for export.

Lolium perenne × **multiflorum** **Long Rotation Ryegrass** **See note on page vi**

Origin	By hybridization of persistent plants of <i>L. perenne</i> and <i>L. multiflorum</i> with further breeding and selection towards a type more resembling the former.
Authority	Grasslands Division, Pl. Res. Bur., Dept. Sci. Ind. Res., New Zealand.
Characteristics	Intermediate in varying degrees between <i>L. perenne</i> and <i>L. multiflorum</i> with tendency <i>L. perenne</i> dominant. It is more palatable, higher producing and more rapidly establishing than <i>L. perenne</i> , but not so persistent.
Adaptation	Designed essentially to suit the role of long-rotation pastures (4-8 years). Mesophytic and temperate climate; good winter production on high fertility soils.
Resistance	Resistant to leaf rust and probably less susceptible to ergot and blind seed disease.
Use	For use in mixtures for short rotation, long rotation and truly permanent pastures.
Grades recognized ?	When seed is available will appear in certified pedigree Mother and standard grades.
Authority for certification	N.Z. Department of Agriculture when seed stocks are commercially available.
On open market ?	Nucleus pedigree stocks only, at present.

Lolium perenne × multiflorum	Short Rotation Ryegrass	See note on page vi
Origin	By hybridization between persistent plants of <i>L. perenne</i> and <i>L. multiflorum</i> with further breeding and selection towards a type resembling the latter.	
Authority	Grasslands Division, Pl. Res. Bur., Dept. Sci. Ind. Res., New Zealand.	
Characteristics	Intermediate in varying degrees between <i>L. perenne</i> and <i>L. multiflorum</i> with definitely <i>L. multiflorum</i> dominant.	
Adaptation	Designed essentially to fill the role of short rotation pastures (2-4 years). Mesophytic and temperate climate but with wide climatic adaptability under short-ley systems of agriculture.	
Resistance	Resistant to leaf rust : less susceptible to ergot and blind seed disease.	
Use	For use alone as short rotation pasture or in mixtures for long rotation and permanent pastures. Good winter production where nitrogen supply adequate. Highly palatable, leading to better and easier pasture utilization. More persistent than Italian ryegrass but not so persistent as long rotation and perennial ryegrass.	
Grades recognized?	N.Z. Certified pedigree " " Mother seed " " standard.	
Authority for certification	N.Z. Department of Agriculture.	
On open market ?	Seed stocks of all grades are commercially available under designation H1 ryegrass.	

Lolium rigidum :

Wimmera ryegrass

Origin	Naturalized in the Wimmera-Mallee areas of Victoria. Possibly hybrid between <i>L. rigidum</i> and <i>L. multiflorum</i> .
Authority	Dept. Agric., Victoria, Australia.
Characteristics	An annual winter grass, variable in type, ranging from <i>L. rigidum</i> to <i>L. multiflorum</i> . Dominant type

assumes an upright growth with rigid geniculate stems but plants with a sprawling growth and branched stems and seedheads also occur. The grass seeds freely and sheds seeds freely. Most growth made in spring, but will make good autumn growth under favourable conditions. Capable of good growth under adverse conditions and will complete its life cycle in very short growing seasons.

Adaptation	Adapted to a wide climatic range in the winter rain-fall zone of Australia, mainly south of latitude 30°S. but its greatest value lies in the area with 14 to 20 in. p.a., or in dry areas with partial irrigation, where on soils of loose texture it will re-establish each year. Usually sown with subterranean clover.
Resistance	Drought resistant. Being an annual it avoids arid summer conditions.
Use	Pasture, meadow hay and silage.
Certified ?	No.
On open market ?	Yes. Seed is available.

An early maturing type has been selected by the Western Australian Department of Agriculture and is now being built up for seed production ; adapted to short season areas. Erect, early.

Lupinus angustifolius :	Sweet lupin	Sweet Blue Lupin
Origin	Sample obtained from Dr. Hudson, Imperial Bureau of Plant Breeding and Genetics, Cambridge, in 1939. Subsequent importation by a commercial firm, source not available.	
Authority	M. A. Black. Selection in New Zealand.	
Characteristics	Morphologically indistinguishable from the ordinary (bitter) blue. Characterized by very low alkaloid content, the maximum found in the cortex of the side stems being <0.01 per cent, compared with 0.8 per cent in the bitter blue, and 0.03 per cent in the seeds compared with 0.9 per cent in the bitter.	
Adaptation	Well suited to conditions in Canterbury, latitude about 43°S., annual rainfall 25 in. and has given satisfactory results in most parts of New Zealand.	
Resistance	Not attacked by white butterfly (<i>Pieris rapae</i>), diamond-back moth (<i>Plutella maculipennis</i>) or aphids. Reasonably winter hardy, except near flowering time. Withstands frosts at 17°F. without apparent injury.	
Use	Of special value as a fodder crop for fattening lambs on account of its great palatability and high protein content. In recent trials it has given better results than rape for this purpose, and may well take the place of rape when the pests named above, and club-root or dry-rot, make rape growing precarious.	
Certified ?	Certification is undertaken by the Department of Agriculture on the basis of low alkaloid content.	
On open market ?	Seed is available on the open market, but not yet in sufficient quantities for export.	

Lupinus angustifolius :	Sweet lupin	Sweet White-flowering Lupin
Origin	White flowering mutant found in a commercial crop of sweet blue lupin.	
Authority	M. A. Black, New Zealand.	
Characteristics	White flowers and white seeds with rust coloured patch at hilum. Breeds true for flower and seed colour and low alkaloid content. Apart from flowers	

and seeds it is indistinguishable from the sweet blue. If its performance proved satisfactory in large scale trials it may eventually take the place of the blue flowering strain because certification will be greatly simplified, as there are no high alkaloid white flowering strains grown in New Zealand.

On open market ? Seed is not available commercially.

Lupinus luteus : **Sweet lupin** **Sweet Yellow Lupin**

Origin Small sample obtained from the Argentine in 1937.

Authority M. A. Black. Selection in New Zealand.

Characteristics Indistinguishable from the ordinary (bitter) yellow. Extremely low in alkaloid. E. P. White found 0.01 per cent in the seeds compared with 0.03 per cent in the sweet blue. Grazing trials have shown it to be even more palatable than the sweet blue.

Adaptation This is probably better suited to the North Island than the South, as it is slow in establishment and early growth under cold conditions. Nevertheless, yield has been considerably improved by selection under Canterbury conditions.

Use Specially suitable as a fodder crop for lamb fattening. In the 1943 fattening trials the rate of gain per lamb-day was 0.34 lb. on giant rape, 0.42 lb. on sweet blue, and 0.71 lb. on sweet yellow lupins.

Certified ? Will be undertaken by the Department of Agriculture when sufficient seed stocks are available.

On open market ? The seed is not yet available commercially.

Medicago media :	Alfalfa	Canauto
Origin	Developed from Grimm, Sask. No. 666, by selection of self-tripping plants in 1930-32. These were synthesized into a strain by repeated crossing in subsequent years.	
Authority	Division of Forage Plants, Central Experimental Farm, Ottawa, Ontario, Canada.	
Characteristics	In leafiness and growth habit not noticeably different from Grimm. The lack of variegation in flower colour distinguishes it from most other <i>M. media</i> varieties. Higher in seed production than other commonly grown varieties.	
Adaptation	For a climate characterized by severe winters, and moderate rainfall, and for a wide range of soil types except poorly drained and acid soil.	
Resistance	No special disease resistance but it is as drought resistant and winter hardy as the commonly-grown <i>M. media</i> varieties.	
Use	Good seed production, especially in seasons unfavourable for normal seed production. In yield of hay, not inferior to Grimm.	
Certified ?	No, but seed is available from the Forage Division, Central Experimental Farm, Ottawa, in small amounts for testing purposes.	

Medicago media :	Alfalfa	High seed-setting strains
Origin	Single plants selected from Grimm and Ladak on basis of their seed setting ability. Selections grouped in strain building plots.	
Authority	Dominion Forage Crops Laboratory, Saskatoon, Sask., Canada.	
Characteristics	Roots, stems, and leaves similar to the standard varieties in type but slightly less variable. Preponderance of blue flowers. Pods principally coiled and in general more strongly coiled than standard varieties. Seed yield exceeds that of standard varieties.	
Adaptation	For sub-humid conditions, comparatively cool temperatures, and soils varying in texture from clay to sandy loam. Latitude of adaptation is similar to that of Grimm and Ladak.	
Resistance	No specific resistance to disease or pests. Drought resistance and winter hardiness are similar to that of Grimm.	
Use	Hay and pasture.	
Certified ?	No.	

Grades recognized? No.

On open market ? No.

Medicago media :

Alfalfa

Viking

Origin

In the winter of 1933-34 the open fertilized progeny, 1st generation inbred progeny, and several 2nd generation inbred progenies of a single plant selected in 1915 survived the winter with very little killing while all the other lines in a fairly large nursery were winter killed. Open fertilized seed from the most vigorous and leafy of the surviving plants was bulked to seed the original increase plots.

Authority

Dominion Forage Crops Laboratory, Saskatoon, Sask., Canada.

Characteristics

Typical tap root, stems as tall growing as standard varieties and varying in erectness from semi-prostrate to erect. Leaves vary in size and shape, similar to Grimm and Ladak. Flowers have considerably more yellow and intergradations between yellow and blue colour than found in Grimm. Somewhat similar to Ladak in flower colour. Pods vary in shape from large and small sickles to many coils. Large sickle pods occur more frequently than in Grimm or Ladak. Considerably more winter hardy than Grimm and at least equal to and probably superior to Ladak. Hay yield on the 1st cut exceeds that of Grimm and is slightly less than in Ladak.

Adaptation

For sub-humid climate having fairly cool temperatures. Thrives on land varying in texture from clay to sandy loams providing sufficient moisture is available. Range of latitude adaptation is similar to that of Grimm and Ladak varieties.

Resistance

No specific resistance to any disease or pest. At least equal to Ladak in drought resistance and winter hardiness and superior to Grimm on these respects.

Use

Hay and pasture. Far more persistent than Grimm under intensive grazing.

Certified ?

Has been accepted for registration by the Canadian Seed Growers Association but so far no growers have been established in registered seed production.

Grades recognized ? Yes. On basis of ancestry of seed, isolation of field, germination, and weed seed content of seed.

Authority for
certification

Registered seed is controlled by the Canadian Seed Growers Association, Ottawa, Ontario, and Certified seed by the Production Service—Plant Products, Dept. of Agriculture, Ottawa, Ontario.

On open market ?

Yes. In very small quantities.

Medicago media :**Alfalfa****Grimm, Sask. 451**

Origin	Mass selected for winter hardiness from surviving plants grown from seed imported from Minnesota.
Authority	Field Husbandry Department, University of Saskatchewan, Saskatoon, Sask., Canada.
Characteristics	Stems purple to green, semi-erect. Leaves compound, elliptical. Flowers, variegated in colour with various shades of blue and a few yellow or tinged with yellow. Pods, spiral. Seeds, greenish amber.
Adaptation	Prefers a cool climate with moderate rainfall from 14 to 30 in. p.a. Thrives on a variety of soils but prefers medium clay loams. Latitude 44 to 54° N.
Resistance	Resistant to winter killing and drought ; has survived winter temperatures of 54°F. No disease or pests have been serious as yet, but <i>Lygus</i> bugs do some damage.
Use	Makes excellent, high protein hay which can be ground into meal and is also useful as hog pasture and in mixtures with grasses for general pastures. Helpful for soil improvement due to the branching root systems and nitrogen gathering bacteria in nodules on the finer roots.
Certified ?	Yes.
Grades recognized ?	Yes, on the basis of viability, quality and purity.
Authority for certification	Canadian Seed Growers' Association and Dominion Department of Agriculture.

Medicago media :**Grimm—Sask. 666**

This strain is similar to the foregoing Grimm, Sask. 451, except that it descends from a single plant selection, is more uniform, has somewhat less variegation in flower colour, and produces seed more abundantly.

Medicago media :	Alfalfa	Macsel
Origin	Claimed to be a cross between alfalfa and Black Medick, made by William Southworth of Ontario Agricultural College, Guelph, Ontario, 1911. (See <i>Journal of Heredity</i> , October, 1914.) Selection continued at Manitoba Agricultural College, Canada, until variety introduced and distributed.	
Characteristics	Variegated blossoms. Similar to Grimm alfalfa and other typical varieties of the <i>media</i> species in habit of growth.	
Adaptation	A very hardy variety, well adapted to northernmost alfalfa-producing areas. Somewhat more hardy than Grimm.	
Use	A good yielder of hay. Will produce two crops during the season throughout most of Manitoba alfalfa-growing area. Normal seed producer.	
Certified ?	Yes.	
On open market ?	Yes.	

Medicago sativa :	Lucerne	Booborowie
Origin	Developed from seed of Hunter River origin after long cultivation in Booborowie district of South Australia.	
Authority	Dept. Agric., South Australia.	
Characteristics	Similar to Hunter River.	
Adaptation	Adapted to dryland conditions.	
Resistance	More drought resistant than other lucerne strains.	
Use	Mainly pasture.	
Certified ?	Certified seed is produced.	
Authority for certification	South Australian Department of Agriculture.	
On open market ?	Seed is produced commercially but is all used locally.	

Medicago sativa :	Lucerne	Creeping lucerne
Origin	Selection from naturally occurring material.	
Authority	Waite Agricultural Research Institute, South Australia.	
Characteristics	Rhizomatous form.	
Adaptation	It is hoped to develop types adapted to deep sandy soil in moderate to good rainfall areas of South Australia.	
Use	Pasture mainly.	
On open market ?	Types are being multiplied but are not available commercially.	

Medicago sativa :	Lucerne	Hunter River
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Known by various place names according to where seed is harvested.

Origin	Has developed from imported seed (mostly of French origin) following long cultivation in the Hunter River and other districts of New South Wales, Australia.
Characteristics	Somewhat variable but the dominant type is an erect, leafy, fine-stemmed, winter-active plant.
Adaptation	Wide range of adaptation in Australia from approximately latitude 25°S. to 45°S. providing soil, moisture and drainage conditions are satisfactory for lucerne. Mainly sown in dense stands for hay in areas of higher rainfall (>25 in. p.a.) but is also sown thinly for grazing under semi-arid conditions (15 to 20 in.) in New South Wales, Victoria and South Australia.
Resistance	Persists under dry conditions.
Use	Hay or pasture.
On open market ?	Seed is usually available commercially in large quantities.

Medicago sativa :	Alfalfa	Ferax
Origin	A composite of selections made from 30 original varieties and strains of <i>M. sativa</i> with a few varieties of <i>M. falcata</i> and intermediate types.	
Authority	Department of Field Crops, University of Alberta, Canada.	
Characteristics	Many stems arise from a crown, varying in different plants from 25-45 in. in length; intermediate branches are arranged more or less on two opposite sides of the main stems, central branches being longer and those above shortening gradually towards the tip of the main stems. Leaves are trifoliolate, the leaflets being linear to obovate or spatulate, and ranging from 18 to 35 mm. long and 6 to 20 mm. wide. Racemes range from 1.5 cm. to 10 cm. long, averaging 3 cm. Colour of flowers varies from nearly white to very dark purple, the majority being light purple, with the occasional variegated purple and yellow-flowered plant. Spirals of pods vary from 0.5 to 3 gyri, and from tight to loose spirals; the type for a given plant is constant.	
Adaptation	For a wide range of non-acid soils with good drainage. Requires in Alberta annual precipitation of 16 in. or more, or artificial irrigation. Has been grown as far north in Alberta as latitude 55°N. It would probably survive where snow cover is adequate at 58° or 59° N.	
Resistance	Susceptible to leaf spot, black stem and bacterial wilt. Winter hardiness is similar to that of Grimm.	
Use	May be used satisfactorily for all purposes. It has the distinction of producing about 40 per cent more seed than Grimm, Ladak, or Cossack in northern Alberta conditions.	
Certified ?	Yes.	
Grades recognized ?	Yes; on the basis of genetic constitution, weed seeds, disease resistance and general appearance.	
Authority for certification	Canadian Seed Growers' Association and the Dominion Department of Agriculture.	
On open market ?	Yes; in very limited amounts as yet. There should be larger supplies in the course of 2 or 3 years. [Information received in 1945.]	

Medicago sativa :	Lucerne	Type No. 8
Origin	Punjab.	
Authority	Fodder Specialist, Sirsa, Punjab, India.	
Characteristics	Perennial, having tufted appearance like No. 9, but is a more vigorous growing type. Leaves are trifoliate. Leaflets somewhat broader than No. 9 and dark green. Flowers are violet and pods of light smoky colour and medium size. Seed is plump, kidney-shaped and yellowish.	
Adaptation	Can grow throughout the Punjab under irrigated conditions, and in all types of soils but medium loam soils are the best.	
Resistance	Resists drought fairly well but cannot stand excess of moisture. Leaf caterpillars do great damage in some years.	
Use	Nutritious fodder crop and gives about 1000 maunds of green fodder in 8 cuttings during a year. Not fit for silage or hay on account of high protein content and unsuitable climatic conditions in the Punjab.	
Certified ?	Yes.	
Grades recognized ?	No.	
Authority for certification	Department of Agriculture, Punjab.	

Medicago sativa :	Lucerne	Type No. 9
Origin	Punjab.	
Authority	Fodder Specialist, Sirsa, Punjab, India.	
Characteristics	Perennial crop with tufted appearance. The stems are semi-erect, round and slightly hairy. Leaves trifoliate. Leaflets elongated with toothed margins, hairy. The flower head is a raceme, flowers are bluish-purple. The pod is coiled spirally upon itself two or three times making a distinct loop. The seed is yellow, kidney shaped.	

Adaptation	Can grow throughout the Punjab under irrigated conditions, and in all types of soils but medium loam soils are the best.
Resistance	Resists drought fairly well but cannot stand excess of moisture. Leaf caterpillars do great damage in some years.
Use	Nutritious fodder crop and gives about 1000 maunds of green fodder in 8 cuttings, during a year. Not fit for silage or hay on account of high protein content and unsuitable climatic conditions in the Punjab.
Certified ?	Yes.
Grades recognized ?	No.
Authority for certification	Department of Agriculture, Punjab.

Medicago sativa :**Lucerne****"Strain B."**

Not yet named.

Origin	Developed from the "Marlborough" variety by the following procedure :—(1) Selected plants selfed and best individuals from best progenies again inbred. (2) Those original selections from which the best inbred progenies were derived were crossed diallelly. (3) The best plants from the best F ₁ progenies were bulked for strain building.
Authority	J. W. Hadfield and R. A. Calder, New Zealand.
Characteristics	A semi-erect to erect growing form which tends to become procumbent as the crop matures ; produces a dense succulent growth with fine stems and with dark green leaves ; recovers quickly after cutting ; commences growth early in the spring and carries on well into the autumn but in the winter becomes dormant.
Adaptation	"Strain B" is adapted more particularly for temperate latitudes ; it is not sufficiently winter hardy to survive the rigorous winters of Continental regions nor is it sufficiently quick growing to compare favourably with local types in sub-tropical latitudes. It nevertheless has a wide range of adaptability within its own particular zone and although it will grow well on a number of soil types, particularly if well drained, thrives best on deep, open, alluvial soil well supplied with lime.
Resistance	Possesses no particular resistance to the diseases which infect lucerne such as leaf spot (<i>Pseudopeziza medicaginis</i>), false mildew (<i>Peronospora trifoliorum</i>), root rot (<i>Rhizoctonia medicaginis</i>), etc.
Use	Can be fed to all classes of stock either green, when it may be cut and carted out or grazed, as hay or as ensilage.
Certified ?	During the season 1943/44 570 lb. of seed were produced under certification by Lincoln College. This seed is to be used for further increase.
Authority for certification	Fields Division, Department of Agriculture, N.Z.
On open market ?	No seed yet available commercially, but it is possible that a limited supply will be distributed subsequent to the 1944/45 harvest.

Medicago sativa :	Lucerne	Grimm Vidarshov
Origin	Selected from Idaho Grimm at Felleskjøkpets Stam-sedgaard, Hjellum.	
Authority	[Information supplied by] H. Wexelsen, Vidarshov-Hjellum, Norway.	
Use	For seed production under adverse seed-growing conditions.	
On open market ?	Being propagated, not yet marketed (March, 1947).	
Medicago tribuloides	[Syn <i>M. truncatula</i>]	Barrel Medic
Origin	Developed from naturally occurring material in South Australia.	
Authority	Waite Agric. Res. Inst., South Australia.	
Characteristics	Vigorous strain adapted to grazing conditions, and forming a prostrate rosette in mixed pastures. The spines of the fruiting pods are not hooked as in <i>M. denticulata</i> and <i>M. minima</i> , thus they do not contaminate wool.	
Adaptation	Adapted to alkaline soils and to climatic conditions similar to subterranean clover.	
Use	Mainly pasture.	
Certified ?	Certified on basis of purity and germination only.	
Grades recognized ?	No, but variation between types on the commercial market is likely.	
Authority for certification	South Australian Department of Agriculture.	
On open market ?	Seed is harvested in South Australia and is available commercially.	

Melilotus sp. :	Sweet clover	Aura
Origin	Selection in Canada from crops grown from seed obtained from International Harvester Company, Grand Forks, North Dakota.	

Characteristics	Distinctly more erect than common yellow blossom sweet clover. Somewhat later in maturity. Blossoms yellow.
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Adaptation	Very hardy, adapted for northern areas.
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Use	High yielding capacity of both hay and seed. On account of fewer trailing branches and more erect growth it constitutes a less serious volunteer problem than common yellow blossom sweet clover.
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Certified ?	Yes.
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On open market ?	Yes.
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Melilotus sp. :	Sweet clover	Maccor
Origin	The mother plant from which original seed obtained was found growing wild in 1913 near the campus of Cornell University, Ithaca, New York. Selection continued at Manitoba Agricultural College, Canada.	

Characteristics	Blossoms white. Growth habit similar to that of common white blossom sweet clover.
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Adaptation	Well adapted to northern areas. Hardy.
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Use	Yields a heavy crop of both forage and seed. Makes a quick growth in the spring exceeding the variety Arctic in that respect. Valuable for both hay and pasture.
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Certified ?	No.
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On open market ?	No.
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Melilotus alba :	Sweet clover	Alpha, Sask. 1528
Origin	Single plant selections from specimens grown from seed produced by an aberrant form found in Arctic sweet clover.	

Authority	Field Husbandry Department, University of Saskatchewan, Saskatoon, Sask., Canada.
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Characteristics	Habit dwarfed ; stems relatively short and fine ; leaves elliptical and numerous ; flowers greenish yellow ; biennial.
Adaptation	For temperate regions with rainfall of from 15-20 in., will thrive on a variety of soils, including clays, clay loams and medium sandy loams ; latitude ranges from 44-54° N.
Resistance	Resistant to winter killing and disease, but susceptible to weevil.
Use	For hay, pasture and soil improvement.
Certified ?	Yes, but owing to labour shortages and sweet clover weevil damage, the quantity available is very small.
Grades recognized ?	Yes, on the basis of purity, quality and viability.
Authority for certification	Canadian Seed Growers' Association and the Dominion Department of Agriculture.
Melilotus alba : Origin	Sweet clover Arctic, Sask. 439 Selected for uniformity from plants grown from Siberian seed supplied by Dr. N. E. Hansen of South Dakota State College.
Authority	Field Husbandry Department, University of Saskatchewan, Saskatoon, Sask., Canada.
Characteristics	Stems green, erect ; leaves compound, elliptical ; flowers, white ; seeds greenish yellow, biennial.
Adaptation	Cool, temperate climate, with from 14-30 in. rainfall p.a. ; prefers clay loam soils but will grow on clays and medium sandy loams. Latitude 44 to 54° N.
Resistance	Resistant to winter killing, drought and disease. Weevils have done serious damage to new seedlings in last 2 years.
Use	For hay or pasture. Helpful in soil improvement.
Certified ?	Yes.
Grades recognized ?	Yes ; on the basis of viability, quality and purity.
Authority for certification	Canadian Seed Growers' Association and Dominion Department of Agriculture.

Melilotus alba :	Biennial sweet clover	Brandon Dwarf
Origin	Apparently a dwarf mutant from common white sweet clover obtained from a commercial seed house.	
Authority	Forage Crops Division, Dominion Experimental Farm, Brandon, Canada.	
Characteristics	The variety is characterized by its dwarf habit of growth and the production of many fine stems. Has a dense, compact appearance. Attains a height of approx. 26 in. (66 cm.) the first season and a maximum height of about 39 in. (95 cm.) the second, when grown in rows 36 in. (91 cm.) apart. Leaf shape is similar to Common white sweet clover. Leaves are borne from the base of the stem to the top. The period of blossoming is somewhat shorter than in Common white resulting in greater uniformity of ripening seed. The flowers are white and borne in racemes which are shorter and more numerous than those on Common white. The yellowish brown seed resembles that of Common white. Compared to Arctic is 2 or 3 days slower in beginning growth in the spring of the second year. It comes into flower at the same time, however, and produces a good yield of seed.	
Adaptation	Most useful where the tall varieties grow too rank and coarse. It does not yield well in light soils where the annual precipitation is less than 16 in.	
Resistance	Not drought resistant.	
Use	Hay quality is superior to that of the tall varieties because of fine stems and leafiness. Useful as a bee pasture, for silage, and important in soil conservation when used in short rotations.	
Certified ?	Yes.	
Grades recognized ?	Yes ; on the basis of viability, purity as to variety, freedom from disease and from weed seeds.	
Authority for certification	Dominion Department of Agriculture.	

Melilotus alba :**Sweet clover****Melana**

Origin	A single plant having the annual habit of growth was found in a nursery of the Alpha variety. This plant was isolated and increased.
Authority	Dominion Forage Crops Laboratory, Saskatoon, Sask., Canada.
Characteristics	Annual, with indeterminate type of growth. Tap root with no crown buds developing in year of seeding. Many branches arise from the crown. Is about one-half the height of the 2nd-year growth in biennial ordinary sweet clover. Very fine. Because of the indeterminate nature of growth seed is difficult to collect in large quantities. Poor competitor against weeds.
Adaptation	Adapted to semi-arid to humid conditions and soils varying in texture from clays to sandy loams. Requires a frost-free period of at least 120 days and preferably much longer. Wide range of adaptation regarding latitude.
Resistance	No specific resistance to any disease or pests. Fairly high drought resistance. Only winter hardy in very mild climates such as southern United States where it may be grown as a winter annual.
Use	For bee pasture after biennial sweet clover varieties have ceased flowering. Used also as a green manure.
Certified ?	No.
Grades recognized ?	No.
On open market ?	Only in very small quantities.

Melilotus alba :	Sweet clover	Pioneer (3)
Origin	In an inbred line of sweet clover selected for low coumarin content a single plant was found which the Clayton-Larmour test showed to be very low in coumarin. This plant was inbred further and increased.	
Authority	Dominion Forage Crops Laboratory, Saskatoon, Sask., Canada.	
Characteristics	Roots are similar to those of ordinary sweet clover. The stems are finer than in ordinary white blossom and are somewhat shorter growing. Leaves, flowers and seed are indistinguishable from ordinary white blossom. Using the Clayton-Larmour colorometric test, the foliage of Pioneer shows little or no indication of coumarin. Using Ufer's fluorometric test the coumarin content is shown to be high. It appears that free coumarin has been eliminated in this variety but that it still contains substantial amounts of bound coumarin.	
Adaptation	For semi-arid to fairly humid conditions and soils varying in texture from clays to sandy loams. It will withstand very low winter temperatures. Probably adapted to latitudes from about 40-45° N., northward.	
Resistance	No specific resistance to any disease or pests. Drought resistance and winter hardiness are similar to Arctic or ordinary white blossom sweet clover.	
Use	Hay or pasture. More palatable as pasture than any of common sweet clover varieties.	
Certified ?	No.	
Grades recognized ?	No.	
On open market ?	No.	
Melilotus alba :	Sweet clover	Strain with permeable seeds
Origin	Selections from Arctic variety inbred and purified for high seed coat permeability.	
Authority	Dominion Forage Crops Laboratory, Saskatoon, Sask., Canada.	
Characteristics	Roots are similar to those of ordinary biennial sweet clover. Stems, leaves and flowers are similar to ordinary white blossom sweet clover. Seeds are similar in size and shape to ordinary sweet clover. In a large percentage of the seeds there are one or more	

	small slightly depressed brownish spots. Germination with scarification averages about 80 per cent.
Adaptation	Adapted to semi-arid to humid climate and soils varying in texture from clays to loams. Will withstand low winter temperatures, prefers fairly cool summer temperatures. Adapted to latitude of about 40-45°N. to limit of northern settlement.
Resistance	No specific resistance to any disease. It has high drought resistance and is very winter hardy.
Use	Hay and pasture.
Certified ?	No.
Grades recognized ?	No.
On open market ?	No.
Melilotus officinalis :	Biennial yellow sweet clover Erector
Origin	Selection of seed of Mammoth Yellow originally obtained from Colorado.
Authority	Forage Crops Division, Dominion Experimental Farm, Brandon, Manitoba, Canada.
Characteristics	The plants attain a height approx. 40in. (100 cm.) in the first season, and about 72 in. (180 cm.) in the second, when grown in 36 in. (91 cm.) rows. Stems erect, lower branches ascending at an acute angle. Flowers are yellow and are borne in numerous slender racemes. The seed is greenish.
Adaptation	Adapted to varied soil types and amounts of precipitation.
Resistance	Winter hardy under Western Canadian conditions.
Use	Useful when grown in a rotation with cereal crops, as its erect growth habit allows all the flowers to be removed. Volunteering from seed set by flowers from the lower branches is thus eliminated. The variety is fully 5 days earlier than the white blossomed varieties. It is useful as a bee pasture, for hay and soil conservation.
Certified ?	Yes.
Grades recognized ?	Yes ; on the basis of viability, purity as to variety, freedom from disease and from weed seeds.
Authority for certification	Dominion Department of Agriculture.

Melilotus officinalis :	Sweet clover	Zouave, Sask. 788
Origin	Progeny of a single plant selection from a variety known as <i>suaveolens</i> .	
Authority	Field Husbandry Department, University of Saskatchewan, Saskatoon, Sask., Canada.	
Characteristics	Stem green, erect and slender. Leaves green, elliptical. Flowers yellow. Seeds greenish yellow ; biennial.	
Adaptation	Clay loam soils preferred, but will thrive on clays and medium sandy loams in a cool, temperate climate ; usually winters satisfactorily in Saskatchewan from latitude 49-54°N.	
Resistance	Moderately drought resistant ; so far is free from disease and insect pests, though it might succumb to weevil.	
Use	Used for hay, soil improvement and pasture, being especially valuable for the latter.	
Certified ?	No.	
Grades recognized ?	Yes, if available.	
Authority for certification	Dominion Department of Agriculture.	
Melilotus parviflora :		Unnamed
Origin	Punjab.	
Authority	Fodder Specialist, Sirsa, India.	
Characteristics	Annual winter fodder crop. Stems are cylindrical and hollow. Fully grown plant attains 4 to 5 ft. Leaves are trifoliate. In early stage of growth the mid-rib of the leaflets has a reddish appearance which disappears later. Shape of the leaflets of a full grown plant resembles that of lucerne. Flower is yellow. Pod is roundish and contains a single seed. Surface of the pod is covered with a fine raised net-work. Seed small, roundish somewhat longer than broad, and brownish-yellow.	
Adaptation	Grown throughout the Province under irrigated conditions, but is gradually being replaced by berseem. It is sown in October and November. Loam and light loam soils are suitable.	

Resistance	No disease or pest has been noticed attacking this crop.
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Use	Nutritious fodder and usually cut and fed green when the pods have begun to form. If fed earlier it may cause bloat. Can be cut and dried, but leaves may shed off under the Punjab climate. Being rich in proteins it is not of much use as silage.
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Certified ?	Yes.
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Authority for certification	Department of Agriculture, Punjab.
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Oryza sativa :	Rice	Antarsal 67, 90, 200 Mugad 81, 141, 161, 249
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Origin	Selection [Information not received regarding distinction between these varieties].	
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Authority	Deputy Director (Crops), Poona, Bombay Province, India.	
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Adaptation	Rain 30 in. to 50 in. with tank irrigation. Shaley retentive soil. Lat. 16°N., Long. 74-5°E.	
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Use	Hay and seed. Good straw.	
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Certified ?	Yes.	
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On open market ?	No.	
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Oryza sativa :	Rice	Bhadas 79, Panwel 61, Patni 6, Varangal 487, Waksal 1, Waksal 207
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Origin	Selection [Information not received regarding distinction between these varieties].	
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Authority	Deputy Director of Agriculture, Ratnagiri, Bombay Province, India.	
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Characteristics	Grain white, coarse.	
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Adaptation	Wet rains 140 in. Laterite soil. Lat. 16-18°N. Long. 70°E.	
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Use	Hay and seed.	
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Certified ?	Yes.	
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On open market ?	No.	
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Oryza sativa :	Rice	K. 42, K 184, K 540, Z 31, Z 39, Z 149.
Origin	Selection [Information not received regarding distinction between these varieties].	
Authority	Deputy Director of Crops, Poona, Bombay Province, India.	
Characteristics	Stem hollow, leaf rough and narrow.	
Adaptation	Wet rains 140 in. Shallow and sticky soil. Lat. 18-20° N. Long. 73° E.	
Use	Hay and seed.	
Certified ?	Yes.	
On open market ?	No.	

Oryza sativa :	Rice	Muskati 1315, Jaddu 1061, Halga 244, Halga 1690
Origin	Selection [Information not received regarding distinction between these varieties].	
Authority	Deputy Director of Agriculture, Ratnagiri, Bombay Province, India.	
Characteristics	Grain white, coarse.	
Adaptation	Rains 100 to 125 in. Laterite soil. Lat. 14° N., Long. 74° E.	
Resistance	None.	
Use	Hay and seed.	
Certified ?	Yes.	
On open market ?	No.	

Panicum coloratum :	Makarikari Strain
Origin	A geographic strain from the Makarikari Pan, Bechuanaland Protectorate.

Authority	[Information supplied by] Dr. L. E. W. Codd, Prinshof, South Africa.
Adaptation	Wide range of adaptability. Suitable for the chief maize and wheat areas with summer rainfall of 25-35 in. per annum.
Resistance	Marked drought resistance.
On open market ?	In commercial production.

Panicum maximum :	Guinea grass	Unnamed
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Authority	Fodder Specialist, Government of Punjab, India.
Characteristics	Perennial grass tufted appearance, with several shoots rising from crown of the plant. Stalks 4 to 5 ft. high slightly compressed and grooved on one side. Leaf sheaths 4 to 5 in. long and about 1 in. broad, upper surface of the leaf blades, especially the lower portions, are hairy. Inflorescence is an open panicle. Seeds small roundish and of shining creamy colour.
Adaptation	Cultivated under irrigated, or non-irrigated conditions where rainfall is high. Best under warm and moist climate. Fertile loam is best. Usually propagated by root stocks.
Resistance	Fairly drought resistant but severe cold retards growth. Is practically free from any pest or disease.
Use	Can be cut and fed green and pastured. Also for silage or hay.
Certified ?	Yes.
Grades recognized ?	No.
Authority for certification	Department of Agriculture, Punjab.

Panicum miliaceum :	Millet	Crown
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Origin	Mass selection from material received from Manchuria in 1928.
Authority	Division of Forage Plants, Central Experimental Farm, Ottawa, Canada.
Characteristics	A relatively fine-stemmed and leafy type of proso millet with an "effusum" type panicle. The seed is broadly oval and brownish grey.
Adaptation	Widely adapted to areas suitable for the proso millets.
Resistance	Considerable drought resistance.
Use	An early maturing proso which is valuable as a catch crop for grain or hay, and as a cover crop in orchards. It is effective as a smother crop in the control of weeds.
Certified ?	Yes, in accordance with the regulations of the Canadian Seed Growers' Association, and the Canada Seeds Act.
Grades recognized ?	Yes, on the basis of purity, germination and disease resistance.
Authority for certification	Canadian Seed Growers' Association, and the Plant Products Division, Department of Agriculture, Ottawa, Ont.
On open market ?	Yes, seed has been produced in volume and is generally available for sale in quantity.

Pennisetum cenchroides :	Anjan grass	Unnamed
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Authority	Fodder Specialist, Government of Punjab, India.
Characteristics	Tufted perennial growing to 2 or 3 ft. Stalks slightly compressed and grooved on one side. Nodes slightly thickened and brownish. Leaf sheaths 1 to 2 in. long, hairy. Leaf blades about 1 ft. long and linear. Upper surface of leaf slightly hairy. Spike 1 to 2 in. long. Spikelets subtended by an involucre of bristles. Seed small.

Adaptation	Grows wild on lighter soils. Cultivated only on a very small scale in the Military Grass Farms. Grows best under warm climatic conditions.
Resistance	Drought resistant. No damage from disease or pest has been noticed.
Use	Cut and fed green or pastured and can be turned into silage or made into hay. It is a good sand binder.
Certified ?	Yes.
Grades recognized ?	No.
Authority for certification	Department of Agriculture, Punjab.

Pennisetum purpureum :	Napier grass	Unnamed
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Authority	Fodder Specialist, Government of Punjab, India.
Characteristics	Tall robust perennial grass growing to 10 or 12 ft. Stems roundish, grooved on one side, leaf sheaths hairy and 4 to 5 in. long. Leaf blades 2 to 3 ft. long and 1 to 2 in. broad. Margins hairy, especially towards the base. The ear 5 to 6 in. long. The spikelets subtended by an involucre of bristles. Does not form any seed under Punjab conditions.
Adaptation	Grows in all soils under irrigation or where rainfall is more than 25 in. Indigenous to tropics and requires warm climate.
Resistance	No serious pest or disease damages this crop. Resists drought fairly well but is adversely affected by severe frost.
Use	Cut and fed green before it becomes woody. Can be dried and turned into silage easily and can be pastured when plants are young.
Certified ?	Yes.
Grades recognized?	No.
Authority for certification	Department of Agriculture, Punjab.

Pennisetum typhoideum :**Pearl millet****Talabadi 207**

Origin	Selection.
Authority	Deputy Director of Agriculture, Surat, Bombay Province, India.
Adaptation	Rain about 25 in. Sandy loam soil. Lat. 18°N., Long. 73°E.
Use	Hay and seed. Fair straw value.
Certified ?	Yes.
Grades recognized ?	Yes.
On open market ?	No.

Phalaris tuberosa :**Australian Common**

Origin	Seed was imported to Australia via the United States about 1884 and grown at Toowoomba, Queensland, from where it was widely distributed. It has become commercialized only since 1920.
Characteristics	Robust and free seeding, somewhat lax when grown for hay, but forms a dense sward under grazing.
Adaptation	Adapted to wide range of soil types in the winter rainfall zone of Australia and is highly drought resistant and persistent where the average rainfall exceeds 18 in.
Resistance	Very drought resistant.
Use	Pasture or hay.
Certified ?	Yes.
Authority for certification	Departments of Agriculture of New South Wales, South Australia and Victoria.
On open market ?	Seed is normally available commercially in large quantities.

Phalaris tuberosa :**Phalaris****Burbanks**

Origin	Originally imported from U.S.A. to Australia.
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Characteristics	The original is a broad-leaved, bulky, poor seeding type which makes early growth in spring and matures late, but samples cannot always be differentiated from the common strain.
Use	Pasture and hay.
Certified ?	Yes.
Authority for certification	New South Wales Dept. Agric.
On open market ?	Seed is available commercially.

Phalaris tuberosa :	Phalaris	Selection 809
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Origin	Selected from common strains.
Authority	New England Experiment Station, Department of Agriculture, New South Wales, Australia.
Characteristics	A leafy, succulent, free-seeding type.
Adaptation	As for common strains.
Use	Pasture and hay.
On open market ?	This strain is in course of development.

Phalaris tuberosa :	Phalaris	Unnamed selection
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Origin	Selection from common strains.
Authority	Council for Scientific and Industrial Research, Australia.
Characteristics	Robust, leafy, selected under summer rainfall conditions.
Adaptation	In preliminary trials has survived better than common strains in area of summer rainfall and winter drought.
Use	Pasture and hay.
On open market ?	Still in stage of development.

Phalaris tuberosa :**Selection**

Variety	Waite Agricultural Research Institute strain. [At this Institute material is available of selected lines of <i>Phalaris tuberosa</i> , together with interspecific hybrids of <i>Ph. tuberosa</i> × <i>Ph. arundinacea</i> , some of which were obtained from Dr. T. J. Jenkin, Welsh Plant Breeding Station, Aberystwyth, and of <i>Ph. tuberosa</i> × <i>Ph. minor</i> .]
Origin	Selection from common strain.
Authority	Waite Agric. Res. Inst., South Australia.
Characteristics	Densely tillered, fine leaves and straw, short, with compact seeds heads, free seeding.
Adaptation	As for common strains.
Use	Pasture and hay.
Certified ?	Seed is to be certified.
Authority for certification	Dept. Agric., South Australia.
On open market ?	Seed supplies have been built up on one property only so far.

Phalaris tuberosa :**Prinshof Selection 2/7**

Authority	[Information supplied by] Dr. L. E. W. Codd, South Africa.
Characteristics	A very leafy strain distinctly superior in yield to the the commercial types.
On open market ?	In commercial production.

Phaseolus aconitifolius :**Moth beans****T. 3**

Authority	Fodder Specialist to Government of Punjab, India.
Characteristics	An annual legume with trifoliate leaves. Semi-spreading early type with yellowish flowers, smoky coloured pods, which are mainly produced on the under side of the plant. The grains are yellowish brown.

Adaptation	Summer crop which can be grown from April to the end of July. Thrives best in warm climates and light soils. Can be grown under irrigated as well as unirrigated conditions, but is more common in rain-fed areas.
Resistance	Fairly drought and disease resistant. The grain is susceptible to weevil attack.
Use	Grown in mixture with other fodder crops like jowar. Nutritious fodder, and can be fed green as well as in dry condition. The dried leaves make a very rich fodder.
Certified ?	Yes.
Grades recognized ?	No.
Authority for certification	Department of Agriculture, Punjab.

Phaseolus aureus :	Mesh	Local
Origin	Palestine.	
Authority	[Information obtained from] Palestine.	
Characteristics	Rapid erect growth, hairy leaves, 8-10 weeks from sowing to cutting ; single cut. Average yield is 2.5-3.5 tons per dunum.	
Adaptation	Adapted to all Palestine. Growth throughout summer, with irrigation.	
Resistance	Susceptible to mildew.	
Use	Soilage.	
Certified ?	No.	
Grades recognized ?	No.	
On open market ?	Yes.	

Phleum pratense :	Timothy	Boon
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Origin	Produced by combining a number of selfed lines with similar characteristics. The lines were selected out of material collected in the provinces of Alberta and Ontario.
Authority	Division of Forage Plants, Central Experimental Farm, Ottawa, Ontario, Canada.
Characteristics	A hay type with an upright habit of growth. Stems relatively tall and slender. Leaves abundant and carried well up on the stems. Seeds are characteristic of the species.
Adaptation	Well adapted to most areas where timothy thrives.
Resistance	Resistant to timothy rust.
Use	A high yielding variety of a species widely used throughout Canada.
Certified ?	Yes in accordance with the regulations of the Canadian Seed Growers' Association and the Canada Seeds Act.
Grades recognized ?	Yes. On the basis of purity, germination and disease.
Authority certification	Canadian Seed Growers' Association and the Plant Products Division, Department of Agriculture, Ottawa, Ontario.
On open market ?	Yes, seed has been produced in varying amounts for the past few years, but present supply cannot be estimated.

Phleum pratense :	Timothy	Drummond
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Origin	Developed from single plant selections obtained from northern Europe ; also strains S.48 and S. 51 from Welsh Plant Breeding Station and strain F.C. 15150 from U. S. Dept. Agric., all introduced during the period 1930-1933.
Authority	Agronomy Department, Macdonald College, McGill Univ., Quebec, Canada.

Characteristics	Stems, leaves, panicles and seeds are indistinguishable from those of ordinary commercial timothy. The strain reaches the flowering and seed stage about 10 to 14 days later than ordinary commercial timothy at Macdonald College. The aftermath yield is similar to that of commercial timothy of the early type, but lacks the stem development in the aftermath shown by the early type.
Adaptation	Although data as yet are limited, the results of comparative tests in different parts of the Province of Quebec indicate equality of yields of Drummond with early strains in the Montreal region, but relatively larger yields in areas with more abundant soil moisture during the month of July, as in the northern and eastern sections of the province.
Resistance	Is rust resistant in careful rust reaction comparisons made with inoculated plants at Macdonald College, whereas ordinary commercial strains are susceptible to timothy rust. Has no special drought resistance but is more resistant to winter injury during severe winters than the Welsh strains S.48 and S.51 at Macdonald College.
Use	Useful in mixtures with red clover for hay and pasture. Its later maturity enables it to prolong the period over which a satisfactory quality of hay may be obtained from timothy in hay meadows and, when blended with an early strain of timothy in a pasture mixture, enables it to extend the period of active growth of this species in the sward.
Certified ?	Yes, in accordance with the regulation of the Canadian Seed Growers' Association and Plant Products Division of the Dominion Department of Agriculture.
Grades recognized ?	Yes. Foundation stock seed is available from Macdonald College and steps are being taken to have registered seed produced under the regulations of the Canadian Seed Growers' Association in 1945.
Authority for certification	Canadian Seed Growers' Association and the Plant Products Division of the Dominion Department of Agriculture.

Phleum pratense :	Timothy	Dural
Origin	Selection begun at Manitoba Agricultural College about 1916 among parent material secured from Cornell University and from the Ontario Agricultural College. Selection in Canada continued for yield, leafiness and resistance to rust.	
Characteristics	Height of plants under reasonably favourable conditions at Winnipeg, Manitoba, about 3 ft., with normal range from 30-40 in. Upwards of 1 per cent of plants may consist of distinctly taller types approaching 4 ft. under the same conditions. Normal range in head length 1-4.5 in. ; occasional heads 5 to 6 in. Anthers purple, nodes light to fairly dark purple, leaves light green (typical of the species), lower 2 or 3 leaf sheaths longer than internode. Sheaths in mid section of plant shorter than internode ; in most cases about 0.5 the internode length. Upper sheaths are less than this. Sheath split and overlapping to base. Leaf blades glabrous, margin finely toothed.	
Adaptation	A winter hardy type well adapted to the more humid areas of Manitoba.	
Use	A high yielding, leafy, fairly rust resistant type, somewhat taller than the average commercial mixture and classified as medium in maturity. Principally a hay grass. A short-lived perennial under Manitoba conditions.	
Certified ?	Yes.	
On open market ?	Yes.	
Phleum pratense :	Hay timothy	Medon
Origin	Selections from introductions from Scandinavia, Russia, Central Europe, Great Britain, U.S.A., and Canada.	
Authority	Department of Field Husbandry, Ontario Agricultural College, Canada.	
Characteristics	Stems are smooth. The erect proportion of stems to the total growth is less than in commercial strains. Leaf-sheath is longer than in commercial strains. Spike is somewhat more compact than the average of commercial strains. Seed is similar in size and colour to commercial strains. Has decidedly a greater number of tillers per plant than commercial strains.	
Adaptation	Very hardy, and widely adapted to Ontario conditions. Does better on heavier phases of soil.	

Resistance	Selected for rust resistance and hardiness.
Use	Hay and pasture crop. Because of its higher percentage of leaf this strain has marked nutritional superiority.
Certified ?	Yes.
Grades recognized ?	Purity of type, freedom from foreign seeds, disease resistance, germination and general appearance.
Authority for certification	Plant Products Division, Dominion Department of Agriculture.

Phleum pratense :	Timothy	Milton
Origin	Developed from strains obtained from Cornell University, University of Minnesota, Svalöf Experiment Station and commercial seed from the Dickinson Seed Co., Chicago, in 1911.	
Authority	Agronomy Department, Macdonald College, McGill Univ., Quebec, Canada.	
Characteristics	Stems, leaves, panicles and seed are indistinguishable from those of ordinary commercial timothy. Early type, maturing at approximately the same time as ordinary commercial strains of timothy in Quebec.	
Adaptation	Well adapted to the climatic and soil conditions of Quebec. No other strain has exceeded it in comparative yield tests at Macdonald College.	
Resistance	Fairly rust resistant in careful rust reaction comparisons made with inoculated plants at Macdonald College, whereas ordinary commercial strains are susceptible to timothy rust. It lacks any special drought resistance but is winter hardy under the severe conditions which frequently prevail in the Province of Quebec.	
Use	For hay and pasture mixtures or any purpose for which timothy is ordinarily used.	
Certified ?	Yes, although not registered under the regulations of the Canadian Seed Growers' Association, small quantities of seed are certified by the Dominion Department of Agriculture, Plant Products Division as being of the Milton variety and as having met the standards of purity and germination required for a certified seed grading under The Seeds Act.	
Authority for certification	Plant Products Division of the Dominion Department of Agriculture.	

Phleum pratense :	Pasture timothy	Pato
Origin	Selections from introduction from Scotland.	
Authority	Department of Field Husbandry, Ontario Agricultural College, Canada.	
Characteristics	Stems are decumbent, smooth and much shorter than commercial strains. Leaves are considerably smaller than commercial strains, but numerous. The flower has a shorter spike than average of commercial strains. Seed is similar in size and appearance to commercial strains. This is a 14-chromosome type that will not cross with commercial strains.	
Adaptation	Is very hardy, and widely adapted to Ontario conditions. Does better on heavier phases of soil.	
Resistance	Selected for rust resistance and hardiness.	
Use	Used principally as bottom grass in hay-pasture mixtures, and as an ingredient in permanent pastures.	
Certified ?	Yes.	
Grades recognized ?	Yes, purity of type, freedom from foreign seeds, disease resistance, germination and general appearance.	
Authority for certification	Plant Products Division, Dominion Department of Agriculture.	

Phleum pratense :	Timothy	Swallow
Origin	Late Swedish stock of (Svalöf) 523 introduced into Alberta in 1918.	
Authority	Department of Field Crops, University of Alberta, Edmonton, Canada.	
Characteristics	Stems are many, 25 to 40 in. high. Leaves long and are distributed well up towards the heads. Good hay type. Heads numerous, averaging 7 or 8 cm. in length. Anthers mauve or yellow, or mixed mauve and yellow.	
Adaptation	For moist clays and loams. Is similar to timothy in general as to climatic requirements. Grown successfully in Alberta at 55° N. lat. and may be successful	

much farther north when moisture conditions are favourable.

Resistance	Considerable resistance to stem rust at Edmonton ; is not drought resistant but is thoroughly winter hardy in northern Alberta.
Use	Suitable for all these uses, but has been selected especially for hay purposes.
Certified ?	Yes.
Grades recognized ?	Yes, on the basis of genetic constitution, weed seeds, disease resistance, germination and general appearance.
Authority for certification	Canadian Seed Growers' Association and the Dominion Department of Agriculture.
On open market ?	Yes, in limited quantity at present.

Phleum pratense : Timothy No. 90

Origin	Selected from very old Stirlingshire stock (a single plant from among 4000).
Authority	[Information supplied by] Messrs. McGill and Smith, Ayr, Gt. Britain.
Characteristics	Leafier than Stirlingshire timothy and about 1 week later in coming into ear. Carries its leaf much higher up the stem and has a characteristic black node on the stem.
Resistance	Not specially resistant.
Use *	Gives better performance on light soils than ordinary Scotch, Canadian or American timothy.
Certified ?	Certain stocks are certified by the Dept. Agric., Scotland, as being distinct from ordinary Stirling timothy.
On open market ?	Yes, but all production can be easily used in home trade.

Phleum pratense :	Timothy	Aberystwyth S48 [See also p. 203]
Origin	Seed from which original plants were grown was collected from wild plants on the margins of a very old pasture in Dorset, where the type was not, however, very plentiful. Similar types have since been obtained from other situations and used in development of the strain.	
Authority	Welsh Plant Breeding Station, Aberystwyth, Gt. Britain.	
Characteristics	In colour plants are similar to ordinary commercial but are later flowering and more winter green. Flowering stems not very tall. Plants broad based, develop a profusion of tillers, and so are dense and leafy.	
Adaptation	Is persistent under heavy grazing, especially where soil is not very light or is not lacking in organic matter.	
Resistance	Highly resistant to rust, but not all the plants are completely immune.	
Use	Should be included in all grazing mixtures on land suitable for timothy. If managed for hay gives good yields.	
Certified ?	Yes.	
Grades recognized ?	Certified.	
Authority for certification	Welsh Plant Breeding Station.	
On open market ?	Yes.	

Phleum pratense :	Timothy	Aberystwyth S50
Origin	Plants on which strain originally based were collected as rootings from old pastures in the Midlands and Kent, but the type has also been found elsewhere in very old pastures. Chromosome numbers are different and so this strain does not readily inter-cross with ordinary timothy.	
Authority	Welsh Plant Breeding Station, Aberystwyth, Gt. Britain.	
Characteristics	Plants form dense, short-leaved grassy cushions. Flowering stems and head relatively short. During and after flowering indeterminate, multi-noded, non-flowering tillers are usually produced which trail close to ground and frequently branch profusely. They root at the nodes if these are trodden into the soil and thus plants are propagated vegetatively.	

Flowers concurrently with American or Scotch timothy but, being a diploid ($2n = 14$), it does not readily intercross with them.

Adaptation	Heavy, damp and peaty soils.
Use	An extreme pasture type. A bottom grass for long grazing leys.
Certified ?	Yes.

Grades recognized ? Certified.

Authority for certification	Welsh Plant Breeding Station.
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On open market ?	Yes.
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Phleum pratense : Timothy Aberystwyth S51

Origin	Based largely on a single plant, and its own immediate progeny, grown from seed collected locally on uncultivated land.
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Authority	Welsh Plant Breeding Station, Aberystwyth, Gt Britain.
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Characteristics	Leaves exceptionally long, but not very broad Light green colour. Flowering stems not very stout nor very tall, but leafage comes high up the stems so that leafy hay is produced. Later flowering than ordinary timothy, but earlier than S48.
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Adaptation	Mainly for hay purposes; gives relatively good aftermath and winter growth.
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Resistance	Highly resistant to rust. Plants recover well after cutting and produce much more aftermath than ordinary timothy.
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Use	Hay type primarily, but more highly tillering than ordinary timothy, and when not grazed hard by sheep, it shows considerable persistency. Should be included in hay leys up to approximately 33 per cent of the timothy.
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Certified ?	Yes.
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Grades recognized ? Certified.

Authority for certification	Welsh Plant Breeding Station.
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On open market ?	Yes.
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Phleum pratense :	Timothy	Stirlingshire
	(Should properly be described as Scotch). Much of the Carse of Stirling district north of the river Forth is in Perthshire and some timothy is grown in the Carse of Gowrie, also in Perthshire. Messrs. McGill and Smith Ltd. therefore maintain that Scotch is a more correct term.	

Origin	Some stocks grown for generations in the Carse of Stirling area, but others have been raised from foreign material such as Saxony and Canadian.
Authority	[Information supplied by] Messrs. McGill and Smith, Ayr, Gt. Britain.
Characteristics	A strong-growing hay type.
Adaptation	Adapted to clay type of soil. Seed crops can be grown from sea level to 300-350 ft.
Use	Generally sown in pure state for haying but is also included in small proportions in nearly all pasture mixtures.
Certified ?	No certification scheme operates.
On open market ?	There is considerable production but supplies are far short of demand.

Phleum pratense :	Timothy	Timothee Heidemaaty
Authority	Ned. Heidemaatschappij, Arnhem, Holland.	
Characteristics	Good tillering capacity, comes into ear late in summer, lush growth.	
Resistance	Resistant to drought and damp.	
Use	Suited for permanent pasture.	
Certified ?	Yes.	
Grades recognized ?	No.	
Authority for certification	N.A.K. General Netherlands Inspection Service for Seeds of Field crops, Zoomweg 11, Wageningen.	
On open market ?	Yes.	

Phleum pratense :	Timothy	See note on page vi
Origin	Breeding from N.Z. and overseas strains, but predominantly from Welsh Plant Breeding Station lines.	
Authority	Grasslands Division, Plant Res. Bur., Dept. Sci. Ind. Res., New Zealand.	

Characteristics	Pasture-hay type, leafy, dense, persistent. Good winter and early spring grower.
Adaptation	Wide mesophytic and temperate to sub-frigid climatic range on fertile soils, damp to wet rather than dry.
Resistance	Relatively free from diseases.
Use	As component in high producing permanent and rotational pastures. Dual purpose hay and pasture.
Grades recognized ?	When seed is available will appear as certified pedigree, Mother and standard grades. N.Z. Uncertified—dominantly hay type.
Authority for certification	Department of Agriculture when commercial seed stocks are available.
On open market ?	Nucleus pedigree stocks only.

Timothy (*Phleum pratense*) is the only representative of the genus used in N.Z. It is confined mainly to damp fertile soils as a minor component of rotational and permanent pastures. The commercial hay types that dominate the seed markets have detracted from the value and use of timothy in pastures other than for hay or short ley purposes.

Phleum pratense :	Timothy	S48 N.Z. once-grown [See also p. 200.]
Origin	Plant selection and breeding from British material.	
Authority	[Information supplied by] E. Bruce Levy, New Zealand.	
Characteristics	Pasture-hay type : dense, leafy, persistent.	
Adaptation	Wide mesophytic, temperate and sub-frigid climatic range. Moist fertile soil types.	
Resistance	Relatively free from diseases.	
Use	Rotational and permanent pastures both for grazing and for hay.	
Grades recognized ?	N.Z. certified mother seed. ,, ,, standard grade.	
Authority for certification	Department of Agriculture.	
On open market ?	Certified grades commercially available.	

Phleum pratense :	Timothy	Grindstad
Origin	Local strain from Østfold, Norway.	
Authority	[Information supplied by] H. Wexelsen, Vidarshov-Hjellum, Norway.	
Use	Widely grown forage.	
Certified ?	Certified seed produced.	

Phleum pratense :	Timothy	Vågånes
Origin	Strain selected at the State Experiment Station, Bodø, from Finnish material.	
Authority	[Information supplied by] H. Wexelsen, Vidarshov-Hjellum, Norway.	
Resistance	Extreme hardiness under northern conditions.	

Phleum pratense :	Timothy	Vidarshov
Origin	Selected at Felleskjøpets Stamsedgaard, Hjellum.	
Authority	[Information supplied by] H. Wexelsen, Vidarshov-Hjellum, Norway.	
Use	For seed and hay production.	
On open market ?	Being propagated. Not yet marketed (March, 1947).	

Phleum pratense :	Timothy	Bore
Origin	Single plant selection from wild material from Värmland.	
Authority	Swedish Seed Association, Värmland Branch Station, Sweden.	
Characteristics	Early, high-yielding, very leafy, good regrowth.	
Adaptation	Middle Sweden.	

Resistance	Winter hardy, resistant to rust.
Use	Hay, pasture, silage, artificially dried fodder.
Certified ?	Yes.
Grades recognized ?	Original seed sold only by the General Swedish Seed Ltd. ; also other seed in the market. For different qualities see page vii.
Authority	The State Central Seed Control Station.
On open market ?	Yes, for export if available.

Phleum pratense :	Timothy	Bottnia
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Origin	Single plant selection in material from northernmost Sweden.
Authority	Swedish Seed Association, Upper Norrland Branch Station, Sweden.
Characteristics	Leafy, high-yielding.
Adaptation	To northern Scandinavia.
Resistance	Very winter hardy, resistant to <i>Sclerotinia borealis</i> .
Use	Hay, pasture, silage.
Certified ?	Yes.
Grades recognized ?	Original seed sold only by the General Swedish Seed Ltd. ; also other seed in the market. For different qualities see page vii.
Authority for certification	The State Central Seed Control Station.
On open market ?	Yes, also for export.

Phleum pratense :	Timothy	Gloria
Origin	Single plant selection in wild material from Scania.	
Authority	Swedish Seed Association, Svalöf, Sweden.	
Characteristics	Leafy, high-yielding.	
Adaptation	To southern and middle Sweden.	
Resistance	Resistant to rust.	
Use	Hay, pasture, silage, artificially dried fodder.	
Certified ?	Yes.	
Grades recognized ?	Original seed sold only by the General Swedish Seed Ltd. ; also other seed in the market. For different qualities see page vii.	
Authority for certification	The State Central Seed Control Station.	
On open market ?	Yes, also for export.	

Phleum pratense :	Timothy	Kämpe II
Origin	Repeated selection in Weibull's Kämpe timothy. This one originates from Finnish timothy.	
Authority	Weibullsholm's Plant Breeding Institute, Landskrona, Sweden.	
Characteristics	Medium late emerging panicle. High yielding in the first cut.	
Adaptation	May be grown in all Sweden.	
Resistance	Resistant to rust and comparatively resistant to drought.	
Use	Hay.	
Certified ?	Yes.	
Grades recognized ?	Original seed sold only by W. Weibull Ltd. Also other seed in the market. For different qualities see page vii.	
Authority for certification	The State Central Seed Control Station.	
On open market ?	Yes, for export if available.	

Phleum pratense :	Timothy	Omnia
Origin	Single plant selection in a line inbred for two generations originating from commercial seed from eastern Scania.	
Authority	Swedish Seed Association, Svalöf, Sweden.	
Characteristics	Plenty of rather broad and long leaves ; erect, stiff straw ; long and dense ears ; very high yielding.	
Adaptation	To all Scandinavia.	
Resistance	Resistant to rust. Winter hardy.	
Use	Hay, silage, artificial dried fodder, pasture.	
Certified ?	Yes.	
Grades recognized ?	Up to 1947 only as original seed sold by the General Swedish Seed Ltd.	
Authority for certification	The State Central Seed Control Station.	
On open market ?	Yes, from 1947 ; also for export.	

Phleum pratense :	Timothy	Vanadis
Origin	Selection in a local strain from Ostergötland.	
Authority	Otto J. Olson and Son Ltd., Hammenhög, Sweden.	
Characteristics	Good regrowth.	
Adaptation	To southern and middle Sweden.	
Use	Hay.	
Certified ?	Yes.	
Grades recognized ?	Original seed sold only by Otto J. Olson and Son Ltd. Also other seed in the market. For different qualities see page vii.	
Authority for certification	The State Central Seed Control Station.	
On open market ?	Yes, not for export excepting for trials.	

Pisum sativum :	Field peas	Collegian
Origin	Early Dun × White Brunswick.	
Authority	Dept. Agric., South Australia.	
Characteristics	Early, purple flowered, more vigorous than White Brunswick and has larger seed and thicker skin.	
Use	Soil improvement and forage. Under trial.	
On open market ?	In small amounts.	

Pisum sativum :	Field peas	Early Dun
Origin	Selected from Dun.	
Authority	[Information supplied by] C. S. Christian, Australia.	
Characteristics	Early.	
Use	Soil improvement and forage in wheat districts.	
On open market ?	Yes.	

Pistum sativum :	Field peas	White Brunswick
Origin	Selected from farmer's crop.	
Authority	Dept. Agric., West Australia.	
Characteristics	Early, white flowered, hardy.	
Resistance	Earliness assists to combat pea weevil and cut worm.	
Use	Soil improvement and forage in short season areas and under severe conditions.	
On open market ?	Yes.	

Pisum sativum :	Field peas	Local
Origin	Palestine.	
Authority	—	
Characteristics	2—3 tons average yield per dunum.	

Adaptation Adapted to all Palestine. Winter crop. With or without irrigation.

Use Soilage, hay.

Grades recognized ? No.

Authority for certification Seed Committee. [A semi-official body consisting of representatives of the Dept. Agric., of the Jewish Agency, of the Field Crop Growers' Association, and of " Hazera " Seed Producers Co-operative.]

On open market ? Yes.

Pisum sativum arvense : **Field pea** **Artturi**

Origin Derived from the fodder pea in West Finland × Glaenö in Denmark.

Authority The Division of Plant Breeding, Experimental Station, Jokioinen, Finland.

Characteristics The seed is brown, white marble colour ; 1000 grain wt. = 180 gr. The stalk is high, flourishing. Black seed-scar. Pod rather small. Early fodder pea.

Adaptation Extensively cultivated.

Use Excellent fodder pea. Because of its small seeds it is suitable also for crops in a ripe state.

On open market ? Yes.

Pisum sativum arvense : **Field pea** **Solo**

Origin The sister species of the Gröppärt, from Plant Breeding Station, Svalöf, Sweden.

Authority [Information received from] Finland.

Characteristics The seed is long (230 gr.), globular, grey colour, with tiny purple points. The stalk is tall and flourishing. A late fodder pea. Light brown scar.

Adaptation Cultivated chiefly in South Finland.

Use Useful green fodder.

On open market ? Yes.

Pistum sativum var. arvense :	Field peas (a) Mammoth Blue (b) White Prolific (c) Mammoth White
Origin	(a) Mammoth Blue. Developed from the cross (Blue Prussian × Harrisons Glory) ; (b) White Prolific developed from the cross (Blue Prussian × Greenfeast). (c) Mammoth White developed from the cross (Victoria Danzig × Stratagem).
Authority	J. W. Hadfield, R. A. Calder and C. M. Driver, New Zealand.
Characteristics	(a) Mammoth Blue. A variety of medium height which reaches approximately 3 ft. at maturity ; stems stout ; foliage vigorous and medium to dark green in colour ; flowers white and occur at the 14th to 16th node ; pods medium length, broad, medium green and straight with rounded to blunt ends ; seeds large smooth and bluish green. (b) White Prolific. A variety of medium height which reaches approximately 3 ft. 6 in. at maturity ; stems slender ; foliage vigorous and medium green ; flowers white and occur at 14th to 16th node ; pods of medium length and breadth ; medium green, and curved with pointed ends ; seed medium size, smooth and white. (c) Mammoth White. A tall variety which reaches to a height of between 4ft. and 5ft. at maturity ; stem stout ; foliage vigorous and light to medium green in colour ; flowers white ; pods medium length, broad and straight with blunt ends ; seeds large, smooth and white.
Adaptation	Field peas are suited more particularly for temperate latitudes, but within such regions have a fair range of adaptability. They prefer cool temperatures with an ample supply of moisture and can be ruined by drought, particularly in the late spring or by continuous wet weather. They can be grown on a number of soil types but thrive best on an open well drained soil well supplied with lime.
Resistance	(a), (b) and (c) possess no particular resistance to diseases such as the root rots which infect peas.
Use	(a) Grown chiefly for the dried seed which may be either canned or packeted and sold for human consumption as a substitute for green peas. (b) and (c) Grown chiefly for the dried seed which is split and polished and sold for making soup. In addition peas may be used for feeding farm animals ; the seed may be crushed and fed to all classes of stock and the straw has considerable feeding value and can be

economically utilized by cattle or sheep; the growing crop may also be fed to lambs as a substitute for rape, the lambs being turned on when the crop is nearly ripe.

Certified ? Both (a) and (b) were first increased under certification in 1942/43 when approximately 200 bus. of the former variety and 350 bus. of the latter were harvested and distributed mainly to seed firms. Certification is confined to those areas sown with nucleus seed and no distinct grades are recognized commercially. (c) is to be increased under certification in 1944/45.

Authority for certification Fields Division, Department of Agriculture, N.Z.

On open market ? Stocks of both (a) and (b) are at present being increased commercially by seed firms but there should be supplies available for marketing after the 1944/45 harvest. (c) is not yet available commercially.

Pisum sativum var. **hortense** : **Garden peas** **Greencrop**
Origin Developed from the cross (Greenfeast × Greatcrop).

Authority J. W. Hadfield, R. A. Calder and C. M. Driver, New Zealand.

Characteristics A variety of medium height which reaches approximately 3ft. at maturity; foliage robust and medium green; flowers white and occur at the 13th to 14th node; pod of medium length and breadth, medium green and curved with a tapering end; seed of medium size, wrinkled and with green cotyledons; early to mid-season in maturity.

Adaptation Similar to those for field peas.

Resistance Possesses no particular resistance to the diseases which infect garden peas.

Use Used mainly for the production of green peas for human consumption but may be utilized for feeding all classes of stock either as green fodder or hay or by crushing the grain and feeding it as a concentrate.

Certified ? Not yet undertaken with garden peas.

On open market ? During the 1943/44 season approximately 120 bus. were harvested from an increase area and distributed to merchants who at present are multiplying their stock.

<i>Pisum sativum</i> ssp. <i>arvense</i> :	Peas	Bottnia A
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Origin	Selection in an old local variety from Ragunda in Jämtland.
Authority	Swedish Seed Association. Upper Norrland Branch Station, Sweden.
Characteristics	Very early to early, thin-stalked, with very small, grey-green seeds with black hilum. Vegetative growth rather poor.
Adaptation	Middle and upper Norrland.
Use	For harvesting when ripe.
Certified ?	No.
On open market ?	At the present time [1946] not in the market.

<i>Pisum sativum</i> ssp. <i>arvense</i> :	Peas	Bottnia B
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Origin	Selection in an old local variety from Ragunda in Jämtland.
Authority	Swedish Seed Association, Västernorrland Branch Station, Sweden.
Characteristics	Very early to early, thin-stalked, very small one-coloured grey-green seeds with black hilum. Vegetative growth rather poor.
Adaptation	Middle and upper Norrland.
Use	For harvesting when ripe.
Certified ?	Yes.
Grades recognized ?	For different qualities see page vii.
Authority for certification	The State Central Seed Control Station.
On open market ?	Yes, also for export.

Pisum sativum ssp. arvense :	Peas	Gröppärt
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Origin	Selection in English Early Britain.
Authority	Swedish Seed Association, Sweden.
Characteristics	Fairly thin stalks. Very large seeds with one-coloured seed coat and light hilum. The vegetative growth rather poor.
Adaptation	Southern and middle Sweden.
Use	For harvest when ripe.
Certified ?	Yes.
Grades recognized ?	Original seed sold only by the General Swedish Seed Ltd. Also other seed in the market. For different qualities see page vii.
Authority for certification	The State Central Seed Control Station.
On open market ?	Yes, also for export.

Pisum sativum ssp. arvense :	Peas	Hero
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Origin	Selection in "Marmorerad ört" from Västergötland.
Authority	Swedish Seed Association, Västergötland Branch Station, Sweden.
Characteristics	Comparatively coarse-stalked, medium early to medium late, large seeds with brown veins and light hilum. Vigorous vegetative growth.
Adaptation	To southern and middle Sweden, except the plain in South Sweden.
Use	As green fodder or hay in mixture with oats, or for harvest when ripe.
Certified ?	Yes.
Grades recognized ?	Original seed sold only by the General Swedish Seed Ltd. Also other seed on the market. For different qualities see page vii.
Authority for certification	The State Central Seed Control Station.
On open market ?	Yes, also for export.

Pisum sativum ssp. arvense :	Peas	Malm
Origin	Selection in "Rättviksärt," a local variety from Dalarna.	
Authority	Swedish Seed Association, Värmland Branch Station, Sweden.	
Characteristics	Medium early, thin-stalked, with small grey-green seeds, spotted seedcoat and black hilum. Vigorous vegetative growth.	
Adaptation	The northern part of middle Sweden and southern Norrland (59-61° N. lat.).	
Use	As green fodder or hay in mixture with oats, or for harvest when ripe.	
Certified ?	Yes.	
Grades recognized ?	Original seed sold only by the General Swedish Seed Ltd. Also other seed on the market. For different qualities see page vii.	
Authority for certification	The State Central Seed Control Station.	
On open market ?	Yes, also for export.	

Pisum sativum ssp. arvense :	Peas	01080
Origin	Solo × Torsdag II.	
Authority	Swedish Seed Association, Svalöf, Sweden.	
Characteristics	Early, comparatively coarse-stalked ; very large, a little flattened, yellow-grey seeds without or with only weak spots and light hilum. Rather vigorous vegetative growth and very high yield of seeds.	
Adaptation	To southern and middle Sweden.	
Use	As green fodder and for harvesting when ripe.	
Certified ?	Yes.	
Grades recognized ?	Original seed sold only by the General Swedish Seed Ltd. For different qualities see page vii.	
Authority for certification	The State Central Seed Control Station.	
On open market ?	Yes, from 1947. Also for export.	

Pisum sativum ssp. arvense :		Peas	Parvus
Origin	Monopol × Ambrosia I		
Authority	Weibullsholm Plant Breeding Institute, Landskrona, Sweden.		
Characteristics	Early, with grey-green, violet-spotted, medium large seeds with light hilum. The vegetative growth comparatively poor.		
Adaptation	To southern and middle Sweden.		
Use	For harvesting when ripe.		
Certified ?	Yes.		
Grades recognized ?	Original seed sold only by W. Weibull Ltd. For quantities see page vii.		
Authority for certification	The State Central Seed Control Station.		
On open market ?	Yes, also for export.		

Pisum sativum ssp. arvense :		Peas	Solo
Origin	Selection in English Early Britain.		
Authority	Swedish Seed Association, Svalöf, Sweden.		
Characteristics	Coarse-stalked, medium early, large seeds with spotted seedcoat and light hilum. Vigorous vegetative growth.		
Adaptation	Southern and Middle Sweden.		
Use	As green fodder or hay in mixture with oats, or for harvest when ripe.		
Certified ?	Yes.		
Grades recognized ?	Original seed sold only by the General Swedish Seed Ltd. Also other seed in the market. For different qualities see page vii.		
Authority for certification	The State Central Seed Control Station.		
On open market ?	Yes, also for export.		

Pisum sativum ssp. arvense :	Peas	Vesta
Origin	Crossing between an old local variety from Skedom in Ångermanland and Toisdag I.	
Authority	Swedish Seed Association, Västernorrland Branch Station, Sweden.	
Characteristics	Very early to early, thin-stalked, rather small seeds mostly without spots and with light hilum. Vegetative growth rather poor.	
Adaptation	To Norrland, except the northern-most parts.	
Use	For harvesting when ripe.	
Certified ?	Yes.	
Grades recognized ?	Original seed sold only by the General Swedish Seed Ltd. Also other seed on the market. For different qualities see page vii.	
Authority for certification	The State Central Seed Control Station.	
On open market ?	Yes, also for export.	

Poa compressa :	Canada bluegrass	Canon
Origin	Selections from introductions from U.S.A. and Canada.	
Authority	Department of Field Husbandry, Ontario Agricultural College, Canada.	
Characteristics	Stems are smooth, flattened, and longer than commercial strains. Higher percentage of leaves than commercial strains. Has compact panicle similar in size and shape to commercial strains. Seed is similar in size, shape and colour to commercial strains. A vigorous leafy type selected for disease resistance and palatability.	
Adaptation	Generally adapted to Ontario conditions but thrives better than Kentucky bluegrass on lighter soils and on the less fertile soils of other phases.	
Resistance	Selected for hardiness and disease resistance.	

Poa pratensis :	Kentucky bluegrass	Delta
Origin	A single plant selection out of native material.	
Authority	Division of Forage Plants, Central Experimental Farm, Ottawa, Ont., Canada.	
Characteristics	Erect, fine stemmed, relatively early. So uniform that its reproduction is either apomictically or by self fertilization.	
Adaptation	Adapted to any area where Kentucky bluegrass now thrives.	
Resistance	Highly resistant to mildew.	
Use	Productive in pasture and desirable in lawn mixture.	
Certified ?	Yes, in accordance with the regulations of the Canadian Seed Growers' Association and the Canadian Seeds Act.	
Grades recognized ?	Yes, on the basis of purity, germination and disease.	
Authority for certification	Canadian Seed Growers' Association, and the Plant Products Division Dominion Department of Agriculture.	
On open market ?	Not at present. Foundation stock seed is available in limited quantity, but since very little Kentucky bluegrass seed is produced commercially in Canada this strain has not been produced in quantity.	
Poa pratensis :	Kentucky bluegrass	Kenon
Origin	Selections from introductions from U.S.A. and Canada.	
Authority	Department of Field Husbandry, Ontario Agricultural College, Canada.	
Characteristics	Stems are smooth, round and longer than in commercial strains ; has a higher percentage of leaves than the commercial strains. Flowers are in a panicle pyramidal in shape, at blossom time similar to commercial strains. Seed is yellowish brown similar in size and shape to commercial strains. A vigorous leafy type of Kentucky Blue, selected for disease resistance and palatability.	
Adaptation	Generally adapted to Ontario conditions, but thrives better on heavier phases of soils and in the more humid sections.	
Resistance	Under U.S. Dept. Agric. tests is very hardy and has considerable disease resistance.	

Use	Used principally as an ingredient of permanent pastures and for turf purposes.
Certified ?	Yes.
Grades recognized ?	Purity of type, freedom from foreign seeds, disease resistance, germination and general appearance.
Authority for certification	Plant Products Division Dominion Department of Agriculture.
Poa pratensis :	Tammisto
Origin	Bred from wild plants of Finnish origin.
Authority	Plant Breeding Station, Tammisto, Finland.
Characteristics	The runners build a close and even sward and are mostly underground. Early development is slow.
Adaptation	Suitable for cultivation from South Finland to Lapland.
Resistance	Very resistant.
Use	One of the most important grass species for Finnish grazing areas.
On open market ?	Yes, marketed in 1935.
Poa pratensis :	Smooth-stalked meadow grass Fylking
Origin	Single plant selection in material from southern Sweden.
Authority	Swedish Seed Association, Svalöf, Sweden.
Characteristics	Late, low, very leafy with very good spreading ability.
Adaptation	All Scandinavia.
Resistance	Resistant against rust and mildew.
Use	Pasture, silage.
Certified ?	Yes.
Grades recognized ?	Original seed sold only by the General Swedish Seed, Ltd. ; also other seed in the market. For different qualities see p. vii.
Authority for certification	The State Central Seed Control Station.
On open market ?	Yes, at the present time for export only for trials.

Poa pratensis :	Smooth-stalked meadow grass	Gullåker
Origin	Selection in wild material from eastern Scania.	
Authority	Otto J. Olson and Son, Ltd., Hammenhög, Sweden.	
Characteristics	High spreading ability, early.	
Adaptation	To southern and middle Sweden.	
Use	Pasture, silage.	
Certified ?	Yes.	
Grades recognized ?	Original seed sold by Otto J. Olson and Son, Ltd. Also other seed in the market. For different quali- ties see p. vii.	
Authority for certification	State Central Seed Control Station.	
On open market ?	Yes, for export only for trials.	
 Poa pratensis :	 Smooth-stalked meadow grass	 Primo
Origin	Selection in collected wild material.	
Authority	Weibullsholm's Plant Breeding Institute, Lands- krona, Sweden.	
Characteristics	Broad leaves, good regrowth.	
Adaptation	To all Sweden.	
Resistance	Resistance against mildew.*	
Use	Pasture.	
Certified ?	Yes.	
Grades recognized ?	Original seed sold only by W. Weibull, Ltd.; also other seed in the market. For different qualities see p. vii.	
Authority for certification	The State Central Seed Control Station.	
On open market ?	Yes, also for export if available.	
 Poa pratensis :	 Smooth-stalked meadow grass	 Skandia II
Origin	Single plant selection in American commercial material.	

Poa serotina :	Late flowering meadow grass	Hammenhögs original Sengröe
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Origin	Selection in wild material.
Authority	Otto J. Olson and Son, Ltd., Hammenhög, Sweden.
Adaptation	All Sweden, on soils rich in humus and under wet conditions.
Use	Hay and pasture.
Certified ?	Yes.
Grades recognized ?	Original seed sold only by Otto J. Olson and Son, Ltd. ; also other seed in the market. For different qualities see p. vii.
Authority for certification	The State Central Seed Control Station.
On open market ?	Yes, also for export.

Saccharum × Sorghum hybrid :	Co. 559
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Origin	A cross between a variety of <i>Saccharum officinarum</i> L. and <i>Sorghum halepense</i> , Palestine. Contains two doses of <i>Sorghum halepense</i> blood. Co. 559=(Vellai × <i>S. halepense</i>) × <i>S. halepense</i> .
Authority	The Government Sugarcane Expert. Imperial Sugarcane Station, Coimbatore, India.
Characteristics	A fodder type with creeping root stocks. Stems erect ; non-flowering culms 4 ft., flowering ones up to 6 ft. ; 1 cm. in diameter ; leaves linear, lanceolate tapering to a fine point, 120 cm. long, maximum width 2 cm., smooth, soft with slightly serrate margins ; sheath glabrous and smooth ; inflorescence a sparsely branched panicle resembling that of <i>S. halepense</i> , Palestine ; rachis smooth. The variety flowers in 3 months and yields a fodder of about 6.5 tons per acre. Four cuttings can be had in one year ; propagated by planting the underground root stock. Planting of stem cuttings not recommended as germination is slow and uncertain.
Adaptation	Still under trial.
Resistance	Still under trial.

Use	As pasture. (Due to very low hydrocyanic acid content can be used for grazing cattle.)
Certified ?	Yes. Propagated by slips.
Grades recognized ?	No.
Authority for certification	The Government Sugarcane Expert. Imperial Sugarcane Station, Coimbatore.
On open market ?	Not available on open market but supplied on request.

Saccharum × Sorghum hybrid : Co. 560

Origin	A cross between a variety of <i>Saccharum officinarum</i> L. and <i>Sorghum halepense</i> , Palestine. Contains two doses of <i>S. halepense</i> blood. Co. 560=(Vellai × <i>S. halepense</i>) × <i>S. halepense</i> .
Authority	The Government Sugarcane Expert. Imperial Sugarcane Station, Coimbatore, India.
Characteristics	A fodder type with creeping root stocks by means of which it is propagated. Stems erect, non-flowering culms 4 ft. flowering ones up to 6 ft. ; 1 cm. in diameter ; leaves linear lanceolate, 80 cm. long, 2 cm. wide with serrate margin, smooth and soft, midrib prominent ; inflorescence a panicle, sparsely branched as in <i>S. halepense</i> , Palestine; 45 cm. long, rachis smooth ; yields 6 tons of fodder per acre.
Adaptation	Still under trial.
Resistance	Still under trial.
Use	As pasture. (Due to very low hydrocyanic acid content can be used for grazing cattle).
Certified ?	Yes. Propagated by slips.
Grades recognized ?	No.
Authority for certification	The Government Sugarcane Expert. Imperial Sugarcane Station, Coimbatore.
On open market ?	Not available in open market but supplied on request.

Origin	A cross between a variety of <i>Saccharum officinarum</i> L. and <i>Sorghum halepense</i> , Palestine. Contains two doses of <i>S. halepense</i> 'blood.' Co. 561=(Vellai × <i>S. halepense</i>) × <i>S. halepense</i> .
Authority	The Government Sugarcane Expert. Imperial Sugarcane Station, Coimbatore, India.
Characteristics	A tufted fodder type with creeping root stock, in appearance and general characteristics very similar to <i>S. halepense</i> , Palestine ; stems slender ; flowering culms 3 ft ; non-flowering ones 2 ft ; 10.5 cm. in diameter ; leaves small and linear, smooth soft ; 45 cm. long and 1 cm. in width ; inflorescence as in <i>S. halepense</i> a loose panicle 20 cm. long, rachis glabrous, smooth ; the outer glume pinkish as in <i>S. halepense</i> , Palestine ; yields a fodder of 6 tons per acre ; propagated by root stocks.
Adaptation	Still under trial.
Resistance	Still under trial.
Use	As pasture and hay. (Due to very low hydrocyanic acid content can be used for grazing cattle).
Certified ?	Yes. Propagated by slips.
Grades recognized ?	No.
Authority for certification	The Government Sugarcane Expert. Imperial Sugarcane Station, Coimbatore.
On open market ?	Not available in open market but supplied on request.

Setaria italica :

Millet

Empire

Origin	A composite of several single plant selections, all similar in type and carrying a bifurcate head characteristic. Obtained from Manchurian material.
Authority	Division of Forage Plants, Central Experimental Farm, Ottawa, Ontario.

Characteristics	4 ft. or more in height, green and very leafy with a strong upright habit of growth. Readily identified by the high percentage of bifurcate heads present. This bifurcate character is dominant, but the degree of expression depends on environment. Seed golden, small and roundish.
Adaptation	For areas where the late hay millets do well.
Use .	Principally for hay, but to some extent as pasture and as a cover crop in orchards.
Certified ?	Yes, in accordance with the regulations of the Canadian Seed Growers' Association, and the Canada Seeds Act.
Grades recognized ?	Yes, on the basis of purity, germination and disease.
Authority for certification	Canadian Seed Growers' Association, and the Plant Products Division, Department of Agriculture, Ottawa, Ont.
On open market ?	Yes, seed has been produced in quantity for some time.

Setaria sphacelata :

Kazungula Strain

Origin	A geographic strain from Kazungula, Northern Rhodesia.
Authority	[Information supplied by] Dr. L. E. W. Codd, Prins-hof, South Africa.
Characteristics	Much more leafy and productive than any other strains of this species that have been tested. Several selections have been made but are not yet true breeding.
Adaptation	Well adapted to the main cereal growing areas with a summer rainfall of 30 to 35 in. per annum.
On open market ?	In commercial production.

Sorghum sp. :	Fodder Sorghum	Perennial Kavirondo
Origin	Believed to have resulted from crossing between grain sorghum in native cultivation and wild sorghum Found near Maseno, Kavirondo, Kenya.	
Authority	Agricultural Department, Kenya. (see <i>E. Afr. Agric. J.</i> Vol. 6, pp. 183-186. 1941).	
Characteristics	Attains height of 8 ft. or more. Quick-growing, perennial crop, well suited for silage production and aftermath can be used for grazing. Stems somewhat hard at maturity. Crop of 10 to 15 tons per acre can be obtained in 12 weeks from seed and 8 weeks from the established roots in a good season. Moderately palatable to cattle as pasture; silage distinctly palatable.	
Adaptation	The crop is intended for use at the dry fringe of the mixed farming country, where the rapid production of material for storage is very important under the rainy seasons of short duration. The possibilities of use will probably be confined to the tropics. In Kenya this sorghum can be grown under rainfall of approximately 20 to 40 in. per annum and at altitudes from 3000 to 6500 ft. Success has been obtained on deep red, lateritic loam and almost black, clay loam.	
Resistance	Under high rainfall and dull weather, a fungus, <i>Sphacelia</i> sp. ("Honey dew"), is prevalent on the flowering heads, and <i>Puccinia purpurea</i> , which is often very severe on imported Sorghum varieties, appears to a negligible degree. Drought resistance is marked. The indications are that the crop will not withstand frost.	
Use	The main use is for the rapid production of a silage crop in areas of low and erratic rainfall. The aftermath is suitable for pasture and there is thus the possibility of use as a ley in these areas.	
Certified ?	No.	
Grades recognized ?	No.	
On open market ?	Not at present, though a small quantity of seed is marketed in Kenya.	

Sorghum cernuum :	Juar	Yerrapusi Jonna, N.J. 314
Origin	A selection from the variety Yerrapusi Jonna, grown in the Kurnool district evolved at the Agric. Res. Station, Nandyal.	

Authority	Millet Specialist, Agric. Coll. Res. Inst., Coimbatore, India.
Characteristics	Reddish purple sheath and glume. Leaf mid-rib dull green. Stem juicy, very sweet. Panicle compact, ovate. Grain white, pearly, bold, much exposed and readily separable from the glumes.
Adaptation	Latitude 14°—16°N. Red clay soils. Growing period is in monsoon season. Suitable for regions of low rainfall.
Use	Fed to cattle as green or dry fodder after crop has flowered, or as dry straw after crop has matured seed, which is collected separately after cutting off panicles.
Certified ?	Yes, at the Agric. Res. Sta., Nandyal.

Grades recognized? No.

Authority for certification Millets Specialist, Agric. Res. Inst., Coimbatore.

On open market ? No.

Sorghum dochna var. irungu : **Juar** **Irungu, K.I. 14**
Origin A selection from the variety grown in the Tinnevely District evolved at the Agric. Res. Station, Koilpatti.

Authority	Millet Specialist, Agric. Coll. Res. Inst., Coimbatore, India.
Characteristics	Blackish purple sheath and glume. Leaf mid-rib white. Stem pitchy, sweet. Panicle loose, elliptic oblong. Grain brown, small, completely enclosed by glumes and not easily separable from the glumes.
Adaptation	Latitude 8°—10°N. Black and red soils. Growing period late monsoon and cold weather seasons. Suitable for regions of low rainfall.
Use	The dry straw, after removal of ear-heads with seed, is given to cattle.
Certified ?	Yes, at the Agric. Res. Sta., Koilpatti.

Grades recognized ? No.

Authority for certification Millets Specialist, Agric. Res. Inst., Coimbatore.

On open market ? No.

Sorghum durra var. mediocre :	Juar	(i) A.S. 3316 (ii) A.S. 3355
Origin	Selections from a hybrid mutant evolved at the Millets Breeding Station, Agric. College and Res. Inst., Coimbatore, India.	
Authority	Millets Specialist of above Institute.	
Characteristics	Reddish purple sheath and glume. Leaf mid-rib dull green. Stem juicy, very sweet. Panicle compact, cylindrical. Grain yellow, brown wash, bold, much exposed and readily separable from the glumes.	
Adaptation	A.S. 3316. Grows well in the Coimbatore District. A.S. 3355 suitable in the central districts of the Madras presidency. Latitude between 9° and 13°N. Red and black loamy soils are best. Suitable for regions of low rainfall (up to 50 in.) Growing period is the hot weather, monsoon season.	
Use	Fed to cattle as green or dry fodder after crop has flowered, or as dry straw after crop has matured seed, which is collected separately after cutting off panicles.	
Certified ?	Yes, at above Breeding Station.	
Grades recognized?	No.	
Authority for certification	Millets Specialist, Agric. Res. Inst., Coimbatore.	
On open market ?	No.	

Sorghum durra var. mediocre :	Juar	Pedda Jonna, G.J. 75
Origin	A selection from the variety Mudda Jonna grown in the Guntur District evolved at the Agric. Res. Station, Guntur.	
Authority	Millets Specialist, Agric. Coll. Res. Inst. Coimbatore, India.	
Characteristics	Reddish purple sheath and glume. Leaf mid-rib white. Stem pitchy sweet. Panicle compact, ovate elliptic. Grain yellow, brown wash, bold, much exposed and readily separable from the glumes.	
Adaptation	Latitude 16°N. Black loamy soils, Growing period is in monsoon season. Suitable for regions of low rainfall.	

Use	Fed to cattle as green or dry fodder after crop has flowered, or as dry straw after crop has matured seed, which is collected separately after cutting off panicles.
Certified ?	Yes, at the Agric. Res. Sta., Guntur.
Grades recognized?	No.

Authority for certification	Millet Specialist, Agric. Res. Inst., Coimbatore.
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On open market ?	No.
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Sorghum sp. :	PS 1
Origin	From a cross between <i>Sorghum sudanense</i> and <i>S. verticilliflorum</i> .

Authority	[Information supplied by] Dr. A. R. Saunders, South Africa.
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Characteristics	Perennial, of <i>S. sudanense</i> type.
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Adaptation	Still in experimental stage.
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On open market ?	Seed not available in quantity.
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Sorghum sp. [Resembles S. nigricans group]	Potchefstroom Haakdoorn
Origin	Selected from material collected near Haakdoorn, in Potgietersrust district.

Authority	[Information supplied by] Dr. A. R. Saunders, South Africa. (See also <i>Fmg. S. Afr.</i> 18, pp. 841-2, and 856, 1943).
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Characteristics	Tall, profusely suckering, heavy yielding type. Similar to American Saccaline, but rather late and inclined to lodge with high soil fertility and abundant moisture.
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Resistance	More resistant to drought than maize.
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Use	Silage crop in Western Transvaal where N in soil is adequate during summer growth. [The effect of sorghum in a system of crop rotation where phosphate is applied is beneficial, except in soils requiring nitrogen]. It is doubtful whether this variety is equally well suited to the eastern grain-producing areas where the season demands a faster-growing type.
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Sorghum sudanense :	Sudan Grass	Selected, unnamed
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Authority	Selected by J. M. Riegart, Yarloop, Western Australia.
Use	Grazing and soiling.
On open market ?	Seed is available commercially.

Sorghum sudanense :	Sudan grass	Unnamed
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Origin	Introduced into the Province from Australia in 1925.
Authority	Fodder Specialist, Government of Punjab, India.
Characteristics	An annual closely related to sorghums with which it readily hybridizes. 3 to 8 ft. high. Stems are usually thin, hardy, 0.25 in. diameter. The panicles are loose, open. Glumes are awned and are pale yellow to purplish.
Adaptation	Does best on rich loams but it can grow on all soil types. Does not thrive well on alkaline soils. Grows well in warm climate. Can be sown from the middle of March to the end of July. The earlier sown crop gives more yield and greater numbers of cuttings.
Resistance	Susceptible to leaf spot and smut. Resists drought fairly well but gives good results if profusely irrigated. Does not grow successfully during winter.
Use	Cut and fed green or can be made into silage. Suitable for drying and makes good hay. Nutritious fodder, and gives as many as 4 cuttings.
Certified ?	Yes.
Grades recognized ?	No.
Authority for certification	Department of Agriculture, Punjab.

Stizolobium pruriens (=Mucuna utilis)	Kachkuri	E. B. 3
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Origin	Selected from a local variety.
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Authority	The Second Economic Botanist to the Government, C.P., and Berar, Nagpur, India.
Characteristics	Very strong twiner. Stem greenish white pubescent, angular. Succulent. Branches numerous. Leaf pinately trifoliate. Leaflets rhomboid, ovate, 4-6 in. long, broad, entire margin, white pubescent beneath, stipule small, lanceolate. Flower dark purple, large papilionaceous, about 1 in. long. Inflorescence nodulose raceme. Calyx two pipped velvety black. Standard shorter than keel which is straight for a part of its length, then curved upwards. Pods 3-4 in. long. Turgid, pubescent, dark green, on maturity turn black. Seed flat, rhomboid. Hilum less than half the length of the seed. An annual herb, grown in rainy season, sown in June or July after break of rains and ready for fodder after about 3 months. A single cut is obtained.
Adaptation	Grown on light to medium loamy soils where there is annual rainfall of 20 in. to 50 in. Sub-tropical climate. Latitude of the Province where grown is 15°—24°.
Use	Green fodder (soilage).
Certified ?	Yes.
Grades recognized ?	No.
Authority for certification	Director of Agriculture, Central Provinces, and Berar, Nagpur.

Trifolium alexandrinum :	Egyptian clover	Miskave
Origin	From Egypt, grown in N.W. Frontier Province, India.	
Characteristics	Growth is slow in early season but later grows quickly. Main succulent stem gives off a few branches terminating in 2 to 3 leaves. Grows about 2 ft. to 3 ft. high, and is relished by cattle. It runs to flower and the stem becomes fibrous. Leaves are oblong, rounded at the extremity. They are green and slightly hairy on upper side especially. Flower heads round, white. Seeds small, the colour ranges from yellow to brownish. Annual, gives 5 to 7 cuttings in a season after which it is left for seed production. Yields 500 to 700 lb. per acre depending upon climate and soil conditions. Dry and mild weather at flowering from mid-May to mid-June is conducive to seed production. Vigorous growth when left for seeding causes lodging and affects yields. Therefore growth should be restricted.	
Adaptation	Adapted to almost all soils, except too sandy, under irrigation. It is sown in September and up to May 6-7 cuttings are taken. Seed is taken in June.	
Resistance	Attacked by <i>Laphygma exigua</i> and <i>Plucia orichalcea</i> . Needs frequent irrigation. Not affected by low temperature except that growth is restricted.	
Use	Usually it is fed green, rarely hay is made.	
Certified ?	Yes ; only at the Agricultural Research Station, Tarnab Farm.	
Grades recognized ?	No. But locally berseem is classified into 3 grades (i) Pure yellow ; (ii) Yellow with mixture of brownish seeds ; (iii) Yellow with greater percent of brownish and weed seeds.	

Trifolium alexandrinum :	Egyptian clover	Fahli
Origin	From Egypt, grown in Palestine.	
Characteristics	Produces single cut annually. Average yield per dunam 2-3 tons.	
Adaptation	Adapted to all Palestine. Winter crop. Without irrigation.	
Use	Soilage, hay, pasture.	
Certified ?	No.	
Grades recognized ?	No.	
On open market ?	Yes.	

Trifolium alexandrinum :	Egyptian clover	Mesqawi
Origin	From Egypt, grown in Palestine.	
Characteristics	Produces annually 5-7 cuts. Average yield per dunam 7-10 tons.	
Adaptation	Adapted to all Palestine. Growth period is October-June. With or without irrigation.	
Use	Soilage, hay, pasture.	
Certified ?	Not officially.*	
Grades recognized ?	No.	
Authority for certification	Seed Committee.*	
On open market ?	Yes.	

*A semi-official body consisting of representatives of the Dept. Agric., of the Jewish Agency, of the Field Crop Growers' Assoc., and of "Hazera" Seed Producers Co-operative.

Trifolium fragiferum :	Strawberry clover	Palestine
Origin	Introduced into Australia by Waite Agricultural Research Institute in 1929 from Rhodesia, where it had been imported from the region of the Sea of Galilee. Commercialised, in 1938, by N. J. McBain, S.E. South Australia.	
Characteristics	Large leaflets and robust stolons. Makes more vigorous development in winter than other strains but is generally more lax in growth habit. Spring flowering.	
Adaptation	Adapted to light-textured as well as heavy soils. May not stand close grazing by sheep so well as the denser strain.	
Resistance	Frost resistant.	
Use	Pasture and meadow hay.	
Certified ?	Yes.	
Authority for certification	South Australian Dept. Agric.	
On open market ?	Small quantities only available commercially.	

Trifolium fragiferum : **Strawberry clover** **Shearman's**

Origin	First observed growing at Fullerton Cave near Newcastle, New South Wales.
Authority	Originally observed and fostered by J. H. Shearman, Australia.
Characteristics	A very vigorous, large-leaved strain which sets little or no seed. It makes most growth in summer and is dormant in winter.
Adaptation	Adapted to fertile, marshy and saline soils and to lighter soils under moist conditions.
Resistance	Frost resistant.
Use	Pasture and meadow hay.
Certified ?	Plant is cultivated from roots.

Trifolium fragiferum : **Strawberry clover** **Swan Hill and Cohuna**

Origin	Has developed naturally in the irrigation areas around Swan Hill and Cohuna, Australia.
Characteristics	Leafy, summer flowering, more vigorous than commercial types.
Adaptation	Adapted to moist, fertile and saline soils.
Resistance	Frost resistant.
Use	Mainly pasture.
Certified ?	No. Usually planted by roots.

Trifolium hybridum : **Alsike clover** **Alon**

Origin	Selections from introductions from U.S.A. and Canada.
Authority	Department of Field Husbandry, Ontario Agricultural College, Canada.
Characteristics	Majority have smooth stems with reddish tinge,

and are taller and more branching than commercial alsike. Leaflets are comparatively short and broad, and are larger than average of commercial type. The flower heads are roundish, and range in colour from white to rose. Seeds are green to dark navy blue with predominance of darker colour. Definitely perennial, hardy under Ontario conditions, and is a good seed setter.

Adaptation	Thrives in all sections of eastern, central and southern Ontario. Adapted to a wide range of soils, but is particularly suited to the heavier types.
Resistance	Selected for resistance to mosaic and mildew.
Use	Used mainly as hay and pasture as well as for soil improvement.
Certified ?	Yes.
Grades recognized ?	Purity of type, freedom from foreign seeds, disease resistance, germination and general appearance.
Authority for certification	Plant Products Division, Dominion Department of Agriculture.

Trifolium hybridum :	Alsike clover	Balingsta
Origin	Local strain from middle Sweden.	
Characteristics	Medium, late, leafy, high-yielding.	
Adaptation	Adapted to middle Sweden up to 61°N. latitude.	
Resistance	Very winter hardy.	
Use	Hay, silage.	
Certified ?	Yes.	
Grades recognized ?	Certified seed is occasionally sold by seed firms. See note on p. vii.	
Authority for certification	The State Central Seed Control Station.	
On open market ?	Yes, but the amount of seed available is normally small.	

Trifolium hybridum : **Alsike clover** **Ostgöta alsikeklöver**

Origin	Under this name are some rather similar local strains from Östergötland, Sweden.
Characteristics	Medium late, leafy, high-yielding.
Adaptation	Southern Sweden up to 59°N. latitude.
Resistance	Winter hardy.
Use	Hay, silage.
Certified ?	Yes.
Grades recognized ?	Certified seed use to be sold by seed firms. See note on p. vii.
Authority for certification	The State Central Seed Control Station.
On open market ?	Yes, also for export if available.

Trifolium hybridum : **Alsike clover** **Sidensjö**

Origin	Local strain from northern Sweden.
Characteristics	Low, late, and very persistent.
Adaptation	Northern Sweden (north of 61° N. lat.).
Resistance	Very winter hardy.
Use	Hay, silage.
Certified ?	Yes.
Grades recognized ?	Certified seed is occasionally sold by seed firms. See note on p. vii.
Authority for certification	The State Central Seed Control Station.
On open market ?	Yes, but the amount of seed available is usually small.

Trifolium hybridum :	Alsike clover	Svea
Origin	Mass selection in old local strains from Östergötland.	
Authority	Swedish Seed Association, Svalöf, Sweden.	
Characteristics	Persistant, very leafy, high yielding.	
Adaptation	To southern and middle Sweden.	
Resistance	Good winter hardiness.	
Use	Hay, pasture, silage.	
Certified ?	Yes.	
Grades recognized ?	Original seed only sold by the General Swedish Seed Ltd. ; also other seed in the market. For different qualities see page vii.	
Authority for certification	The State Central Seed Control Station.	
On open market ?	Yes. Also for export, if available.	

Trifolium pratense :	Red clover	Dollard
Origin	Developed from strains of Orel and Silesian sources introduced in 1911.	
Authority	Agronomy Department, Macdonald College, McGill Univ., Quebec, Canada.	
Characteristics	Moderate development of flowering stems in seeding year, when seeded in early spring. Typical double-cut habit of growth in following (first harvest) year, providing two cuts of hay, or one cut of hay and one of seed. Pubescence moderate, not so pronounced as with ordinary commercial strains. Leaves and flower heads are similar in shape and size to those of ordinary red clover. A percentage of the leaves does not carry the marking (macula). Colour of flower heads ranges from white to dark red, with pink shades predominant. Seeds are similar in size and colour to those of ordinary red clover. They vary in colour from yellow to purple. Although of the early double-cut type, this strain may persist into the third season under favourable conditions.	
Adaptation	In comparative tests this strain is relatively better adapted than other early, double-cut strains to conditions of southern Quebec. However, further testing may reveal a much wider adaptation on account of the severity of winter conditions in this part of eastern Canada.	
Resistance	Although this strain may not possess greater freedom from disease than other strains at Macdonald College, its exceptional vigour enables it to withstand the attacks of mosaic, mildew and root rot better than other strains which have been tested here. Although not specially drought resistant, this strain is more winter hardy than any other early, double-cut strain yet tested at Macdonald College.	
Use	Useful in mixtures with timothy and alsike clover or alfalfa for hay or pasture. The aftermath from hay meadows may be used for many purposes, hay, pasture, seed, or ploughed under as green manure.	
Certified ?	Yes, in accordance with the regulations of the Canadian Seed Growers' Association.	
Grades recognized ?	Yes, on the basis of pedigree, purity, germination and disease. <i>Registered seed</i> is traceable to foundation stock and produced under isolated conditions. It must attain a high standard as regards trueness to variety; and	

absence of weed seeds, and must germinate well. *Certified seed* must attain a somewhat higher standard of purity, freedom from weed seeds, and germination, than is required of commercial seed. *Commercial seed* must meet the standards for purity and germination as defined in The Seeds Act. (See The Seeds Act, 1937, for standards of Registered, Certified and Commercial grades of red clover seed.)

Authority for certification	Canadian Seed Growers' Association and the Plant Products Division of the Dominion Department of Agriculture.
Trifolium pratense	var. perenne : Red clover
Origin	Leon Selections from introductions from Scandinavia, Great Britain, U.S.A., and Canada.
Authority	Department of Field Husbandry, Ontario Agricultural College, Canada.
Characteristics	80-90 per cent smooth stems. First year growth consists of a rosette of leaves with occasional seed stalks. Subsequent years produce one crop of abundant seed stalks followed by a second growth of leaves with occasional seed stalks. Leaflets somewhat elongated. The majority have pronounced horseshoe-shaped areas, particularly on primary leaves. The flower heads range from round to oval, and from white to red with a marked predominance of red. Seed colour varies from yellow to purple. This variety is distinctly hardy, perennial, and about 2 weeks later in maturity than the average double cut type under central Ontario conditions. It produces seed abundantly under favourable conditions.
Adaptation	Thrives in all sections of eastern, central and southern Ontario. Adapted to a wide range of soils.
Resistance	Selected for resistance to mosaic, <i>Sclerotinia</i> , mildew, and rust. It is quite hardy under Ontario conditions.
Use	For hay and soil improvement, but suitable also for inclusion in short term pastures, or for silage and artificially dried fodder.
Certified ?	Yes.
Grades recognized ?	Purity of type, freedom from foreign seeds, disease resistance, germination and general appearance.
Authority for certification	Plant Products Division, Dominion Department of Agriculture.

Trifolium pratense :	Red clover	Manhardy
Origin	Escape plants from seed obtained in the vicinity of Winnipeg and from Dr. Seager Wheeler, Rosthern, Saskatchewan, Canada.	
Characteristics	The predominantly non-hairy stem is outstanding. Upwards of 95 per cent plants smooth throughout or smooth except for slight pubescence towards upper part of plant. Remaining 5 per cent hairy to slightly hairy. Petioles usually more hairy than stems. Flowers deep lavender. The V-shaped marking uniformly present. Height under favourable conditions about 24 in. at full bloom.	
Adaptation	Somewhat more winter hardy than ordinary red clover. Adapted to more humid sections of Manitoba.	
Use	A one-cut clover adapted for hay or seed production. Will persist 3 to 5 years.	
Certified ?	Yes.	
On open market ?	Yes.	

Trifolium pratense :	Red clover	Ottawa
Origin	Developed by mass selection from 1920 to 1936. The original material consisted of regional strains grown by farmers in the Ottawa valley.	
Authority	Division of Forage Plants, Central Experimental Farm, Ottawa, Ont., Canada.	
Characteristics	Of the early or double-cut type. The bloom is medium dark red and the seed contains a high proportion of dark purple. Leaves are large and stem and leaves are hairy.	
Adaptation	For a wide range of soil types. While adapted to northern latitudes it requires a moderate amount of rainfall.	
Resistance	Considerable resistance to <i>Sclerotinia libertiana</i> . The hairiness of leaf and stem protects it from leaf-hopper attack. It possesses a maximum amount of winter hardiness for the climatic conditions of the Ottawa valley.	
Use	Generally hay yields are better than in other double-cut varieties. The life cycle is that of a short-lived perennial, thus giving it more than average persistence for pasture purposes.	

Certified ?	Yes, registered seed.
Grades recognized ?	Yes, on basis of adaptability of variety yield, persistence, hardiness, purity and germination.
Authority for certification	The Canadian Seed Growers' Association, and the Plant Products Division, Production Service, Dominion Department of Agriculture.
On open market ?	The seed must be obtained from growers of registered seed. There is not yet sufficient seed for domestic requirements.

Trifolium pratense :	Red clover	Redon
Origin	Selections from introductions from Scandinavia, Great Britain, U.S.A. and Canada.	
Authority	Department of Field Husbandry, Ontario Agricultural College, Canada.	
Characteristics	65-70 per cent smooth stems. First-year growth consists of a rosette of leaves and seed stalks in majority of cases. Subsequent years give early spring growth with two crops of seed stalks per season. Fewer elongated leaflets than in perennial strain. Majority of leaflets have pronounced horse-shoe-shaped area, particularly on primary leaves. The flower heads range from round to oval and from white to red, with a marked predominance of red. Seed colour varies from yellow to purple. Particularly leafy strain, and very hardy under Ontario conditions.	
Adaptation	Thrives in all section of eastern, central and southern Ontario. It is adapted to a wide range of soils.	
Resistance	Has been selected for resistance to mosaic, <i>Sclerotinia</i> mildew and rust. Quite hardy under Ontario conditions.	
Use	For hay and soil improvement but suitable also for inclusion in short term pastures, or for silage and artificially dried fodder.	
Certified ?	Yes.	
Grades recognized ?	Purity of type, freedom from foreign seeds, disease resistance, germination and general appearance.	
Authority for certification	Plant Products Division, Dominion Department of Agriculture.	

Trifolium pratense var. perenne :**Red clover****Altaswede**

Origin	Late Swedish red clover introduced in 1914.
Authority	Department of Field Crops, University of Alberta, Canada.
Characteristics	In the first season the growth is a rosette of leaves and very short stems with very few flowering stalks. In the second and subsequent years flowering stems are numerous, erect or spreading, quite tall and branched. They are green early in the season, but as they become older many turn reddish. About 45 per cent of the plants are smooth-stemmed, 45 per cent are smooth except for slight pubescence on the terminal internodes. Practically, about 90 per cent of the plants are smooth stemmed and 10 per cent are hairy. The leaves are elongated, the younger being somewhat pointed while the older ones are rounder at the extremity. They are pale green, and hairy on both sides. Flower heads are somewhat oval-shaped, and the flower colour varies from white (rare) to red with varying shades of pink predominating. The seeds are smaller and more variable in size than those of common red clover. In mass they seem yellowish. Actually about 60 per cent are yellow, while the remainder are light and yellowish purple. The clover is perennial, late flowering, and single-cut in Edmonton conditions. It produces seed abundantly.
Adaptation	Adapted to many kinds of soil, but is best on clay loams carrying a fair amount of lime. Average annual precipitation should be 17 in. or more with continuous snow cover throughout the winter. Latitude of adaptation in Alberta is 51.5 to 56° N. when precipitation is sufficient.
Resistance	Somewhat susceptible to powdery mildew disease (<i>Erysiphe polygoni</i>) at Edmonton and vicinity. It is not very drought hardy, but it is the most winter-hardy so far tried in northern Alberta.
Use	Useful for hay, pasture (in grass mixture), soilage and soil conservation. The stems are often rather coarse for good hay.
Certified ?	Yes.

Grades recognized ?	Yes ; on the basis of genetic constitutions, weed seeds, disease resistance, germination and general appearance.
Authority for certification	Canadian Seed Growers' Association and the Dominion Department of Agriculture.

Trifolium pratense :	Red clover	Tammisto
Origin	Raised from natural plants of Finnish origin in Tuulos.	
Authority	Plant Breeding Station, Tammisto, Finland.	
Characteristics	Of late red clover type being rank, leafy, yielding good crops. Fruiting qualities fair. Flowers of the general red clover type. Seeds of yellow and purple colouring.	
Adaptation	Adapted principally for South and Central Finland.	
Resistance	Relatively resistant to clover-rot (<i>Sclerotinia trifoliorum</i>). Wintering good.	
Use	A valuable plant for mowing and grazing.	
Grades recognized ?	No official certification in Finland.	
On open market ?	Yes, marketed in 1937.	

Trifolium pratense :	Red clover	S123
Origin	Based on plants selected from Montgomery red and Cornish Marl clovers.	
Authority	Welsh Plant Breeding Station, Aberystwyth, Gt. Britain.	
Characteristics	General agreement with local strains from which derived, but with higher degree of uniformity, and greater persistency. Growth relatively slow, but dense in spring, the lower internodes being shorter and the branching more profuse than in ordinary red clovers. Full-grown plants bushy and leafy. Spreading habit ; flowers towards end of July.	
Adaptation	General.	
Resistance	Good winter survival.	
Use	Pasture plant. Good crops often obtained in 3rd and 4th years. If cut for hay at end of June, gives good aftermath. Should be included in mixtures for leys of over 1 year.	
Certified ?	Yes.	
Grades recognized ?	Certified.	
Authority for certification	Welsh Plant Breeding Station.	
On open market ?	Yes.	

Trifolium pratense :	Red clover	S151
Origin	Bred on the basis of the best single plants selected from Vale of Clwyd and English Broad Red clover.	
Authority	Welsh Plant Breeding Station, Aberystwyth, Gt. Britain.	
Characteristics	Is about 5 days later in flowering than English Broad Red. Denser and forms a more rosette-like plant than either parent type, but is more open and lax than either S123 or Montgomery. At flowering time the crop is slightly less tall than English Broad Red and has much more leafage.	
Adaptation	For average soil conditions.	

Use	Being a medium-early plant it supplies early hay and grazing and contributes to the aftermath of the second harvest year. The combination of earliness with persistency is an improvement on the commercial early clovers, especially under average conditions for leys of more than 1 year's duration.
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Certified ?	Yes.
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Grades recognized ?	Certified.
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Authority for certification	Welsh Plant Breeding Station.
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On open market ?	Yes.
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Trifolium pratense :	Red clover	Vale of Clwyd
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Origin	A local strain, originating in the valley of the river Clwyd in Denbighshire.	
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Authority	Vale of Clwyd Seed Growers, Ltd., Gt. Britain.	
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Characteristics	Resembles English Broad Red in general type, but is capable of heavier yields and flowers a week to 10 days later than ordinary Broad Red. In trials at the Welsh Plant Breeding Station it is more persistent than are other early types, and under average conditions gives better and more reliable establishment. High tillering capacity.	
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Adaptation	General.	
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Use	The total yield of hay and aftermath is heavier than that of English Broad Red, but the slightly later time of flowering makes it less bulky in aftermath when both are cut for hay at the same time. Compared with other commercial early varieties, it is more persistent in 2nd harvest year.	
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Certified ?	Yes.	
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Grades recognized ?	Two grades are recognized—(a) Stock Seed Grade ; (b) Certified Seed Grade for seed mixtures only.	
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Authority for certification	The Vale of Clwyd Seed Growers, Limited.	
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On open market ?	All the seeds are sold through Agents.	
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Trifolium pratense :	Red clover	Gendringsche Roode Klaver
Origin	Endemic variety.	
Authority	Barenbrug's Zaadhandel, Wholesale firm, Arnhem, Holland.	
Characteristics	Somewhat earlier than Groninger Roode Klaver, Roode Maasklaver and Roosendaalsche Roode Klaver, with finer foliage.	
Use	Hay, silage, soil conservation and 1-year leys.	
Certified ?	Yes.	
Grades recognized ?	Yes, sometimes officially certified reproduction seeds are available, originating from certified endemic seeds grown within a limited district.	
Authority for certification	N.A.K. General Netherlands Inspection Service for Seeds of Field crops, Zoomweg 11, Wageningen.	
On open market ?	Available for open market and export.	

Trifolium pratense :	Red clover	Groninger Roode Klaver
Origin	Endemic variety.	
Authority	Dr. R. J. Mansholt, Breeder, Westpolder, Holland.	
Characteristics	Good yield, large foliage, little pubescence.	
Adaptation	Suited for clay and sandy soils.	
Resistance	Good winter hardiness.	
Use	Hay, silage, soil conservation, and 1-year leys.	
Certified ?	Yes.	
Grades recognized ?	Yes, sometimes officially certified reproduction seeds are available, originating from certified endemic seeds grown within a limited district.	
Authority for certification	N.A.K. General Netherlands Inspection Service for Seeds of Field crops, Zoomweg 11, Wageningen.	
On open market ?	Available for open market and export.	

Trifolium pratense : **Red clover** **Roode Maasklaver**

Origin	Endemic.
Authority	Landbouwbelang Roermond, N.V.J. Joordens, Venlo-Blerick, Centraal Bureau, Rotterdam, Holland.
Characteristics	Good yield of foliage, little pubescence.
Adaptation	Suited for clay soils.
Use	Hay, silage, soil conservation and 1-year leys.
Certified ?	Yes.
Grades recognized ?	Yes, sometimes officially certified reproduction seeds are available, originating from certified endemic seeds grown within a limited district.
Authority for certification	N.A.K. General Netherlands Inspection Service for Seeds of Field crops, Zoomweg 11, Wageningen.
On open market ?	Available for open market and export.

Trifolium pratense : **Red clover** **Roosendaalsche Roode Klaver**

Origin	Endemic.
Authority	Ver. de Klaverbloem, Farmer's co-operation, Roosendaal, Holland.
Characteristics	Good yield of large foliage, little pubescence.
Adaptation	Suited for sandy soils.
Use	Hay, silage, soil conservation and 1-year leys,
Certified ?	Yes.
Grades recognized ?	Yes, sometimes officially certified reproduction seeds are available, originating from certified endemic seeds grown within a limited district.
Authority for certification	N.A.K. General Netherlands Inspection Service for Seeds of Field crops, Zoomweg 11, Wageningen.
On open market ?	Available for open market and export.

Trifolium pratense :	Broad Red Clover or Cowgrass	See note on page vi
Origin	Breeding of world-wide ecotypes.	
Authority	Grasslands Division, Plant Res. Bur., Dept. Sci. Ind. Res., New Zealand.	
Characteristics	Moderately dense, bulky, rapid establisher, early growth.	
Adaptation	Mesophytic and temperate climate ; wide climatic range in short ley farming systems but not particularly winter hardy.	
Resistance	Susceptible to <i>Sclerotinia trifoliorum</i> and virus.	
Use	Major clover constituent of temporary pastures. Valuable for grazing or hay.	
Grades recognized ?	N.Z. certified pedigree. ,, ,, Mother seed. ,, ,, standard grade. ,, uncertified.	
Authority for certification	Department of Agriculture.	
On open market ?	All grades will soon be commercially available.	

TRIFOLIUM.—Two strains of red clover, cowgrass (or broad red clover) and Montgomery red clover are important in N.Z. for temporary and short rotation leys. They figure also as temporary constituents of the long rotation and permanent pasture.

Trifolium pratense var. :	Montgomery Red Clover	See note on page vi
Origin	Breeding from original material from Montgomeryshire and Cornwall, Gt. Britain.	
Authority	Grasslands Division, Plant Res. Bur., Dept. Sci. Ind., Res., New Zealand.	
Characteristics	Dense crowned, leafy, late flowering, late grower.	
Adaptation	Temperate to sub-frigid climates, winter hardy and winter dormant.	
Resistance	Susceptible to <i>Sclerotinia trifoliorum</i> and virus.	

Use	High value clover for short-ley pastures for grazing or hay.
Grades recognized ?	N.Z. certified pedigree. " " mother seed. " " standard grade. " uncertified.
Authority for certification	Department of Agriculture.
On open market ?	All grades commercially available.

Trifolium pratense :	Red clover	Leinum
Origin	From district of Tønndelag.	
Authority	[Information supplied by] H. Wexelsen, Vidarshov-Hjellum, Norway.	
Characteristics	Late strain, but somewhat earlier than Molstad, otherwise similar to it and to Toten.	

Trifolium pratense :	Red clover	Molstad
Origin	Unknown.	
Authority	[Information supplied by] H. Wexelsen, Vidarshov-Hjellum, Norway.	
Characteristics	A late strain. Aftermath growth is small.	
Adaptation	In <i>Herb. Abstr.</i> 15, Abs. 303, this variety is recorded as being less winter hardy than Pečorskiï in tests at Kola Base, USSR. In <i>Herb. Abstr.</i> 13, Abs. 1701, is recommended for the districts Trøndelag, Møre and Romsdal.	
Resistance	Strain is very winter hardy and has been widely grown and tested for more than 50 years.	
Certified ?	Yes.	

Trifolium pratense :	Red clover	Toten
Authority	[Information supplied by] H. Wexelsen, Vidarshov-Hjellum, Norway.	
Characteristics	Similar to Molstad. Slightly later strain.	

Trifolium pratense :**Prinshof Selection**

Authority	[Information supplied by] Dr. L. E. W. Codd, South Africa.
Characteristics	Selected for longevity and upright habit.
Adaptation	For cultivation under irrigation.
Resistance	More resistant to high summer temperatures than most varieties.
On open market ?	Not yet produced.

Trifolium pratense :**Red clover****Essi**

Origin	Collection of clover plants in a 3rd-year ley sown with cocksfoot and early clover from Bohemian.
Authority	Otto J. Olson and Son, Ltd., Hammenhög, Sweden.
Characteristics	Early type, but a little later than Silesian clover.
Adaptation	Southern Sweden.
Resistance	More resistant against clover stem rot than Silesian clover.
Use	Hay, silage.
Certified ?	Yes.
Grades recognized ?	Original seed sold only by Otto J. Olson and Son, Ltd.; also other seed in the market. For different qualities see page vii.
Authority for certification	The State Central Seed Control Station.
On open market ?	Yes, but not for export excepting for trials.

Trifolium pratense :**Red clover****Göta**

Origin	Selection in local strains from eastern Östergötland.
Authority	Algot Holmberg and Sons, Ltd., Norrköping, Sweden.

Characteristics	The flowers bright red, the stems pale green without anthocyanin. High yielding and good regrowth. Rather persistent.
Adaptation	Southern and middle Sweden, specially on acid soils.
Resistance	Winter hardy.
Use	Hay.
Certified ?	Yes.
Grades recognized ?	Original seed sold only by Algot Holmberg and Sons Ltd. ; also other seed in the market. For different qualities see page vii.
Authority for certification	The State Central Seed Central Station.
On open market ?	Yes, for export if available.

Trifolium pratense :	Red clover	Harrie
Origin	Local strain from Scania, Sweden.	
Characteristics	Medium late, comparatively early in flower. Flowers with very short corolla.	
Adaptation	To southern Sweden.	
Use	Hay, silage.	
Certified ?	Yes.	
Grades recognized ?	Sold as registered red clover strain ; also sold with sealing of qualified seed and with common State sealing.	
Authority for certification	The State Central Seed Control Station.	
On open market ?	Yes, also for export if available.	

Trifolium pratense :	Red clover	Hassle-Säby
Origin	Local strain from Västergötland, Sweden.	
Characteristics	Rather late, high yielding.	
Adaptation	To the western part of Sweden between 60-61°N. lat.	
Resistance	Winter hardy and comparatively resistant to clover stem rot.	
Use	Hay silage.	
Certified ?	Yes.	
Grades recognized ?	Sold as registered red clover strain.	
Authority for certification	The State Central Seed Control Station.	
On open market ?	Yes, but for export only if available.	

Trifolium pratense :	Red clover	Karaby
Origin	Local strain from Scania, Sweden.	
Characteristics	Medium late, leafy and high yielding. Very short corolla.	
Adaptation	To southern Sweden.	
Resistance	Comparatively resistant to clover stem rot and clover eelworm.	
Use	Hay, silage.	
Certified ?	Yes.	
Grades recognized ?	Sold as registered red clover strain ; also sold with sealing of qualified seed and with common State sealing.	
Authority for certification ?	The State Central Seed Control Station.	
On open market ?	Yes, also for export if available.	

Trifolium pratense :	Red clover	Kilafors
Origin	Local strain from middle Sweden.	
Characteristics	Late type, leafy and persistent.	
Adaptation	To latitudes 61-62°N.	
Resistance	Winter hardy.	
Use	Hay, silage.	
Certified ?	Yes.	
Grades recognized ?	Sold as registered red clover strain.	
Authority for certification	The State Central Seed Control Station.	
On open market ?	Yes, but for export only if available.	

Trifolium pratense :	Red clover	Kusträsk
Origin	Local strain from most northern part of Sweden.	
Characteristics	Late, leafy, flowers clear red, very persistent.	
Adaptation	For the part of Sweden north of 65°N. lat.	
Resistance	Very winter hardy.	
Use	Hay, silage.	
Certified ?	Yes.	
Grades recognized ?	Sold as registered red clover strain.	
Authority for certification	The State Central Seed Control Station.	
On open market ?	Yes, but for export only if available.	

Trifolium pratense :	Red clover	Merkur
Origin	Mass selection in the old local strain Spannarp from Scania.	
Authority	Swedish Seed Association, Svalöf, Sweden.	
Characteristics	Medium late, high yielding, good regrowth, flower colour as a rule red with single white-flowering plants.	
Adaptation	To southern and middle Sweden.	
Resistance	Very resistant to clover stem rot and clover eelworm.	
Use	Hay, silage and artificially dried fodder.	
Certified ?	Yes.	
Grades recognized ?	Original seed sold only by the General Swedish Seed, Ltd. ; also other seed in the market. For different qualities see page vii.	
Authority for certification	The State Central Seed Control Station.	
On open market ?	Yes. Also for export depending upon amount of seed available.	

Trifolium pratense :	Red clover	Norra Edsberg
Origin	Local strain from Värmland, Sweden.	
Characteristics	Late, persistent, high yielding.	
Adaptation	The western part of Sweden between 59-61°N. lat.	
Resistance	Winter hardy.	
Use	Hay, silage.	
Certified ?	Yes.	
Grades recognized ?	Sold as registered red clover strain.	
Authority for certification	The State Central Seed Control Station.	
On open market ?	Yes, but for export only if available.	

Trifolium pratense :	Red clover	Offer
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Origin	Local strain from middle Norrland, Sweden.
Characteristics	Late type, but rather early in flower. Persistent.
Adaptation	For the part of Sweden between 62-65°N. lat.
Resistance	Very winter hardy.
Use	Hay, silage.
Certified ?	Yes.
Grades recognized ?	Sold as registered red clover strain ; also sold with sealing of qualified seed and with common State sealing.
Authority for certification	The State Central Seed Control Station.
On open market ?	Yes, but for export only if available.

Trifolium pratense :	Red clover	Resistenta
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Origin	Repeated selection in the Danish strain Ötofte medium late.
Authority	Weibullsholm's Plant Breeding Institute, Landskrona, Sweden.
Characteristics	Medium late, leafy, good regrowth, flowers generally light red, but a few plants with white flowers may occur.
Adaptation	To southern and middle Sweden.
Resistance	Resistant to clover stem rot and clover eelworm.
Use	Hay, silage.
Certified ?	Yes.
Grades recognized ?	Original seed sold only by W. Weibull, Ltd. ; also other seed in the market. For different qualities see page vii.
Authority for certification	The State Central Seed Control Station.
On open market ?	Yes, for export if available.

Trifolium pratense :	Red clover	Sörby-Okna
Origin	Local strain from Östergötland, Sweden.	
Characteristics	Rather late, high yielding.	
Adaptation	The eastern part of Sweden between 60-61°N. lat.	
Resistance	Winter hardy and comparatively resistant to clover stem rot.	
Use	Hay silage.	
Certified ?	Yes.	
Grades recognized ?	Sold as registered red clover strain ; also sold with sealing of qualified seed and with common State sealing.	
Authority for certification	The State Central Seed Control Station.	
On open market ?	Yes, but for export only if available.	

Trifolium pratense :	Red clover	Spannarp
Origin	Local strain from Scania, Sweden.	
Characteristics	Medium late, leafy and high yielding.	
Adaptation	To southern Sweden.	
Resistance	Comparatively resistant to clover stem rot and clover eelworm.	
Use	Hay, silage.	
Certified ?	Yes.	
Grades recognized ?	Sold as registered red clover strain ; also sold with sealing of qualified seed and with common State sealing.	
Authority for certification	The State Central Seed Control Station.	
On open market ?	Yes, for export if available.	

Trifolium pratense : Red clover Svalöf's Purebred Late Clover (Svalöf's renodlade senklöver)

Origin	Mass selection in an old local strain from middle Sweden.
Authority	Swedish Seed Association, Svalöf, Sweden.
Characteristics	Late type, very leafy, flower colour as a rule dark red, but with single light red or white-flowering plants.
Adaptation	To southern and middle Sweden.
Resistance	Good winter hardiness.
Use	Hay, silage and artificially dried fodder.
Certified ?	Yes.
Grades recognized ?	Original seed only sold by the General Swedish Seed Ltd. ; also other seed in the market. For different qualities see page vii.
Authority for certification	The State Central Seed Control Station.
On open market ?	Yes. Also for export depending upon amount of seed available.

Trifolium pratense : Red clover Ultuna

Origin	Local strain from Upland, Sweden.
Characteristics	Late, persistent, high yielding.
Adaptation	Adapted to 59-61°N. lat.
Resistance	Winter hardy.
Use	Hay, silage.
Certified ?	Yes.
Grades recognized ?	Sold as registered red clover strain ; also sold with sealing of qualified seed and with common State sealing.
Authority for certification	The State Central Seed Control Station.
On open market ?	Yes, but for export only if available.

Trifolium pratense :	Red clover	Wambása
Origin	Probably a spontaneous crossing between Swedish late and Siberian early red clover. Local strain from Blekinge, Sweden.	
Characteristics	Early type, but more leafy and higher yielding than other early strains. Very large leaves and flowers. Flowering comparatively late.	
Adaptation	To southern Sweden.	
Use	Hay, silage.	
Grades recognized ?	Sold as registered red clover strain.	
Authority for certification	The State Central Seed Control Station.	
On open market ?	Yes, but for export only if available.	

Trifolium repens :	White clover	Victorian Irrigation
Origin	A natural selection which has developed under good cultural practice in the irrigation districts of Victoria.	
Authority	Dept. Agric., Victoria, Australia.	
Characteristics	Large-leaved form of white clover with coarse stems, large leaves and long flower stalks. Very productive, with a long growing season.	
Adaptation	Best suited to areas with a regular moisture supply, particularly to irrigation areas where regular and frequent watering is possible.	
Resistance	Is sustained by good irrigation culture. The farms where this clover develops and dominates other types are generally those where superphosphate was used in pre-war days at the rate of 4-5 cwt. per acre every year.	
Use	Pasture and hay.	
Certified ?	Yes.	
Grades recognized ?	No.	

Authority for certification	Victorian Department of Agriculture.
On open market ?	Seed is harvested and sold commercially in limited amounts.

Trifolium repens :	White Dutch clover	Duron
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Origin	Selections from introductions from Great Britain and Scandinavia.
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Authority	Department of Field Husbandry, Ontario Agricultural College, Canada.
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Characteristics	Has creeping stems which root at joints, and are smooth. Leaflets are definitely roundish, some with horse-shoe markings on primary leaves. The flower heads are white, roundish and less numerous than in the average commercial strain. The seed ranges from yellowish to reddish, is similar in size to commercial strains. More persistent than the commercial strain, and appears to have greater drought resistance.
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Adaptation .	Thrives in all sections of eastern, central and southern Ontario. Adapted to a wide range of soils.
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Resistance	Has been selected for resistance to mosaic and mildew.
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Use	Principally used as pasture.
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Certified ?	Yes.
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Grades recognized ?	Purity of type, freedom from foreign seeds, disease resistance, germination and general appearance.
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Authority for certification	Plant Products Division, Dominion Department of Agriculture.
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Trifolium repens :**White clover****Pathfinder****Origin**

From a collection of seed of wild white clover made at Nappan, Nova Scotia, a mass nursery was set out and selection made on the basis of good spreading habit, leafiness, persistence and abundant bloom. These selections were grown in clonal rows and the best rows were harvested and bulked.

Authority

Division of Forage Plants, Central Experimental Farm, Ottawa, Ont., Canada.

Characteristics

Similar to New Zealand wild white in growth habit, or midway between Kentish wild white and Ladino. A high proportion of the plants have pronounced leaf markings. It produces an abundance of bloom, pale, pinkish white in colour.

Adaptation

Thrives in a climate of moderate rainfall ; is adapted to a wide range of soil type and is tolerant of highly acid soils.

Resistance

Quite winter hardy, surviving for 6 winters at Ottawa. In drought it becomes dormant, but renews growth quickly with rain.

Use

Distinctly a pasture species and combines well in a sward with such grasses as timothy, bluegrass and red top.

Certified ?

No.

Trifolium repens :**White clover****S100****Origin**

Based on selections from N.Z., White Dutch and Wild White clovers.

Authority

Welsh Plant Breeding Station, Aberystwyth, Great Britain.

Characteristics

Large leaflets borne on long stems arising from relatively stout surface runners which root fairly readily at the nodes. Begins growth earlier in spring than wild white clover and continues growing later into the autumn.

Adaptation

Average to good fertility.

Use

On good soils and with good management persists well for at least 6 seasons, while under average soil conditions gives good results for 3 years. Used for pasturing sheep and cattle, and for producing protein-rich cuts for silage and dried grass.

Certified ?

Yes.

Grades recognized ? Certified.

Authority for certification	Welsh Plant Breeding Station.
On open market ?	Yes.
Trifolium repens :	White clover S 184
Origin	Bred from dense, vigorous plants derived from various wild populations native to Britain.
Authority	Welsh Plant Breeding Station, Aberystwyth, Gt. Britain.
Characteristics	Similar to wild white of commerce, but leaves are slightly larger and darker green. Time of flowering coincides with that of wild white, but the pedigree strain is denser and individual plants more uniform in performance.
Adaptation	General.
Resistance	As persistent and hardy as wild white.
Use	May be used to replace commercial wild for leys of long duration, and for short leys on poorer soils.
Certified ?	Yes.
Grades recognized ?	Certified.
Authority for certification	Welsh Plant Breeding Station.
On open market ?	Yes.
Trifolium repens :	White clover Wilkla weideklaver
Origin	Selected from endemic variety.
Authority	Fa D. J. v d. Have, Wholesale firm. Kapelle-Biezelinge, Holland.
Characteristics	Fine foliage, very good tillering capacity.
Use	Pasture, soil conservation, long leys.
Certified ?	Yes.
Grades recognized ?	No.
Authority for certification	N.A.K. General Netherlands Inspection Service for Seeds of Field crops, Zoomweg 11, Wageningen.
On open market ?	Yes.

Trifolium repens :	White clover	Witte Weideklaver C.B.
Origin	Selection from endemic variety.	
Authority	Centraal Bureau Farmer's Co-operation, Rotterdam, Holland.	
Characteristics	Mixture of fine and bigger types. Rich foliage. Good tillering capacity.	
Use	Pasture, soil conservation, long leys.	
Certified ?	Yes.	
Grades recognized ?	No.	
Authority for certification	N.A.K. General Netherlands Inspection Service for Seeds of Field crops, Zoomweg 11, Wageningen.	
On open market ?	Yes.	

Trifolium repens :	White clover	See note on page vi
Origin	(a) Pedigree grade. Breeding from best N.Z. ecotypes. The pedigree grade consists entirely of large leaved, strong stolon type with a picric acid reaction of 6/6. (b) The mother grade is mostly ex pedigree but may include the best natural ecotypes. All are large-leaved strong stolon types with a minimum picric acid reaction of 6/6. (c) Permanent pasture grade may be ex pedigree or mother or from good natural ecotypes that are below mother seed standard. Such latter types are smaller-leaved and of less robust habit, although they are good reliable and persistent strains of white clover. The minimum picric acid grade is 4/6. For comparison the European Dutch White has 0/6 picric acid reaction and the N.Z. uncertified types vary from 1/6 to 3/6 picric acid reaction.	
Authority	Grassland Division, Plant Res. Bur., Dept. Sci. Ind. Res., New Zealand.	
Characteristics	Pedigree and Mother strains. Large-leaved, strong stolon, high production and long seasonal spread of production. Highly persistent. Rather aggressive in dairy pastures and in grass crops intended for seed production. Strong nitrifying influence on the soil.	
Adaptation	Mesophytic and temperate climates, moist and fertile soils. Wide seasonal spread of production.	

Resistance	Relatively free in N.Z. from diseases.
Use	Pastures for dairying, fat lambs and cattle.
Grades recognized?	N.Z. Certified pedigree " " Mother seed " " Permanent Pasture " Uncertified.
Authority for certification	Department of Agriculture.
On open market ?	All grades are commercially available.

NOTE : The N.Z. certified permanent pasture grade is apt to vary more in type than any other N.Z. certified seed owing to the fact that more than one type appears in the certified permanent pasture grade.

This species is by far the most important clover in N.Z. It has a wide range of adaptability in pastures for dairy cows, sheep and cattle. It associates well with most sward-forming grasses and allows full and free exploitation of phosphates and lime in pasture construction and maintenance. The better strains also have marked effect on nitrogen increase in the soil and this is reflected in thrift of companion grasses and in follow-on-crops where rotational grazing is practised.

Trifolium repens :	White clover	A0403
Origin	Mass-selection in wild material from northern Sweden.	
Authority	Swedish Seed Association, Västernorrland Branch Station, Sweden.	
Characteristics	Low, small-leaved, persistent, good spreading ability.	
Adaptation	To northern Sweden.	
Resistance	Very winter hardy.	
Use	Pasture.	
Certified ?	Yes.	
Grades recognized ?	Only with certification of control growing. See also page vii.	
Authority for certification	The State Central Seed Control Station.	
On open market ?	Seed available on the market but not for export excepting for trials.	

Trifolium repens :**White clover****Hero.**

Origin	Mass-selection in the Danish Morsö-strain.
Authority	Swedish Seed Association, Svalöf, Sweden.
Characteristics	Very good spreading ability, persistent.
Adaptation	To southern and middle Sweden.
Resistance	Drought resistant.
Use	Pasture and silage.
Certified ?	Yes.
Grades recognized ?	Original seed only sold by the General Swedish Seed, Ltd. ; also other seed in the market. For different qualities see page vii.
Authority for certification	The State Central Seed Control Station.
On open market ?	Yes. Also for export if available.

Trifolium repens :**White clover****Robusta**

Origin	Selection in the Danish strain Styrnö.
Authority	Weibullsholm's Plant Breeding Institute, Landskrona, Sweden.
Characteristics	Tall. Flowering a little later than in Morsö. Uniform yield during the summer. Less spreading ability than Morsö.
Adaptation	To south Sweden.
Resistance	Very resistant to drought.
Use	Pasture and in hay leys.
Certified ?	Yes.
Grades recognized ?	Original seed sold only by W. Weibull, Ltd. ; also other seed in the market. For different qualities see page vii.

Authority for certification The State Central Seed Control Station.

On open market ? Yes, for export if available.

Trifolium subterraneum : **Subterranean clover** **Bacchus Marsh**

Origin Naturalized in the Bacchus Marsh District.

Authority Tested by Dept. Agric., Victoria, Australia.

Characteristics An early mid-season variety with long runners but is leafier than other early flowering types.

Adaptation Used on acid to neutral soils in the winter rainfall zone south of latitude 30°S. and where the average rainfall is just below the minimum requirements of mid-season varieties of subterranean clover, i.e. about 20 in., and the growing season is at least 7 months.

Resistance Its early maturity permits it to avoid summer drought conditions better than the late flowering varieties, but it will stand dry weather during the growing season.

Use Mainly as pastures.

Certified ? Yes.

Grades
 recognized ? No.

Authority for
 certification Victorian Department of Agriculture.

On open market ? Yes, in limited quantities.

Trifolium subterraneum :	Subterranean clover	Dwalganup
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Origin	Found naturalized at Boyup Brook, Western Australia.
Authority	Dept. Agric., Western Australia.
Characteristics	A very early maturing strain with long sparsely leaved runners.
Adaptation	Adapted to acid to neutral soils of fairly low fertility in the winter rainfall zone south of latitude 30°S. in areas where the annual rainfall is 17 to 30 in. and the growing season at least 5.5 to 6 months. Phosphate is necessary on most of these soils.
Resistance	Its extreme earliness allows it to avoid long dry summers better than other varieties. It will, however, set seed under most adverse conditions.
Use	Mainly pasture, the mature burrs being particularly valuable during the dry summer period.
Certified ?	Seed is certified in Western Australia and South Australia.
Grades recognized ?	Two grades usually available.
Authority for . certification	Departments of Agriculture, W. Aust. and S. Aust.
On open market ?	Yes.

Trifolium subterraneum :	Subterranean clover	Early Dalisk
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Origin	Naturalized at York (Western Australia).
Authority	Dept. Agric., Western Australia.
Characteristics	An early maturing strain, a little later than Dwalganup.
Adaptation	Probably best adapted to conditions slightly better than those suitable for Dwalganup.
Resistance	Less susceptible to leaf rust than most other varieties.
Use	Mainly pasture.

Certified ?	No.
Grades recognized ?	No.
On open market ?	This strain has not been commercialized to the same extent as the others but small quantities of seed are harvested.

Trifolium subterraneum : **Subterranean clover** **Mt. Barker**

Origin	Naturalized at Mt. Barker, South Australia.
Authority	The possibilities of the species, and the variety Mt. Barker in particular, were first recognized and developed by Mr. A. Howard, Australia.
Characteristics	Mid-season maturity. Has long runners but is leafier than the earlier strains.
Adaptation	This is the most common strain and is best suited to the winter rainfall zone where the annual rainfall exceeds 21 in. and the growing season is 7.5 or more months south of latitude 30°S. It is adapted to soils of the podzolised type with light-texture surface horizons, slightly acid to neutral, and retentive subsoils. The addition of phosphate is usually required on these soils, and occasionally trace elements, for example molybdenum, are also required.
Resistance	Drought resistant.
Use	Mainly pasture, the mature burrs being particularly valuable in the summer, but also cut in mixed pastures for meadow hay.
Certified ?	Seed is certified in South Australia, Victoria, Western Australia, New South Wales and Tasmania.
Authority for certification	The Departments of Agriculture in the States in which it is certified.
On open market ?	Yes.

Trifolium subterraneum :	Subterranean clover	Mulwala
Origin	Naturalized in Berrigan district, New South Wales.	
Authority	Dept. Agric., Victoria, Australia.	
Characteristics	An early maturing strain similar to Dwalganup in appearance.	
Adaptation	Probably adapted to conditions slightly better than those suitable for Dwalganup.	
Resistance	Drought resistant. Early maturity allows it to escape summer drought. Highly resistant to leaf rust.	
Use	Mainly pasture.	
Certified ?	Yes.	
Authority for certification	Department of Agriculture, New South Wales.	
On open market ?	Seed is usually available in limited quantities.	

Trifolium subterraneum :	Subterranean clover	Tallarook
Origin	Naturalized at Tallarook, Victoria.	
Authority	Dept. Agric., Victoria, Australia.	
Characteristics	Very leafy, late flowering strain with much branched short runners.	
Adaptation	Requires a long growing season and higher rainfall than the early and mid-season varieties and is best adapted to those portions of the winter rainfall zone where the annual rainfall exceeds 25 in. and the growing season is 8.5 to 9 months.	
Resistance	Less drought resistant than earlier strains.	
Use	Pasture and meadow hay.	
Certified ?	Yes.	
Authority for certification	Victorian Department of Agriculture.	

On open market ? Seed is available commercially.

Trifolium subterraneum : **Subterranean clover** **White Seeded**

Origin	Naturalized at Yarloop (Western Australia).
Authority	Dept. Agric., Western Australia.
Characteristics	White seed. Time of flowering is between that of Dwalganup and Mt. Barker.
Adaptation	Will thrive under conditions too wet for the Mt. Barker strain.
Certified ?	No.
Grades recognized ?	No.
On open market ?	In early stages of development only.

Triticum vulgare : **Forage wheat** **Baroota Wonder**

Origin	Selected from Ward's Prolific 1895.
Authority	G. Crittenden Telowie, S. Australia.
Characteristics	Early hay variety.
Resistance	To flag smut.
On open market ?	Yes.

Triticum vulgare : **Forage wheat** **Bencubbin**

Origin	Gluyas Early $\times$ Nabawa.
Authority	E. J. Limbourn, Merredin Expt. Farm, W. Australia.
Characteristics	Early to midseason maturity.
Resistance	To flag smut and stem rust.
Use	Dual purpose.
On open market ?	Yes.

Triticum vulgare :	Forage wheat	Firbank
Origin	Zealand × Maffra.	
Authority	William Farrar [1890], N.S. Wales, Australia.	
Characteristics	Very early, tall.	
Resistance	To flag smut.	
Use	Hay.	
On open market?	Yes.	

Triticum vulgare :	Forage wheat	Florence
Origin	[(White Naples × Imp. Fife) × White Naples] × Imp. Fife × Eden.	
Authority	William Farrar [1901], N.S. Wales, Australia.	
Characteristics	Very early, tall.	
Resistance	To bunt, stem rust.	
Use	Hay and green fodder.	
On open market ?	Yes.	

Triticum vulgare :	Forage wheat	Ford
Origin	(Fan × Comeback) × (Zealand × Tardent's Blue).	
Authority	W. J. Spafford and R. C. Scott, S. Australia.	
Characteristics	A midseason variety.	
Resistance	To stem rust, flag smut.	
Use	Dual purpose, especially where liable to stem rust except in driest districts.	
On open market?	Yes.	

Triticum vulgare :	Forage wheat	Grasby
Origin	Huguenot × Federation.	

Authority	C. Harper and W. C. Grasby, Western Australia.
Use	For early hay.
On open market ?	Yes.

Triticum vulgare :	Forage wheat	Turvey
Origin	Selected from Purple Straw.	
Authority	Farmers' selection, in Australia.	
Characteristics	Late, tall.	
Use	Hay.	
On open market ?	Yes.	

Triticum vulgare :	Forage wheat	Warden
Origin	(Quartz $\times$ Wart's White) $\times$ Red Bordeaux.	
Authority	H. Pye, Dookie Agric. College, Victoria, Australia.	
Characteristics	Red grain.	
Use	Hay.	
On open market ?	Yes.	

Triticum vulgare :	Forage wheat	Zealand
Origin	French Wheat introduced into Australia.	
Characteristics	Late hay variety.	
Resistance	To flag smut.	
Use	Hay.	
On open market ?	Yes.	

Triticum vulgare :	Wheat	Hen Gymro S70
Origin	Bred and selected from 265 original selections from commercial stocks of Hen Gymro.	
Authority	Welsh Plant Breeding Station, Aberystwyth, Gt. Britain.	
Characteristics	Grain red. Beardless ; chaff white or pale red ; pubescent. Straw long but relatively stiff.	
Adaptation	For land of relatively poor quality. Grain ripens well under adverse conditions. Good standing crops can be grown on better soils in drier areas, where soil is firm, dry and stony, and does not naturally tend to an over production of straw. Should be sown not later than early October.	
Resistance	Hardy, and maintains dense growth in exposed situations.	
Use	Grain production, and for soils of lower fertility than are required for good crops of Standard Red.	
Certified ?	Yes.	
Grades recognized ?	Two, Certified A and Certified B.	
Authority for certification	Welsh Plant Breeding Station in conjunction with Seed Growers' Association.	
On open market ?	Yes.	

Triticum vulgare :	Wheat	Hen Gymro S72
Origin	Bred and selected from 265 original selections from commercial stocks of Hen Gymro.	
Authority	Welsh Plant Breeding Station, Aberystwyth, Gt. Britain.	
Characteristics	Beardless ; chaff white, smooth. Straw shorter and weaker than S70. Grain red, smaller than that of Standard Red.	
Adaptation	Suits lighter soils than those on which Standard Red is best, and is later in ripening.	

Resistance	As for S70.
Use	As for S70.
Certified ?	Yes.
Grades recognized ?	Two, Certified A and Certified B.
Authority for certification	Welsh Plant Breeding Station in conjunction with Seed Growers' Association.
On open market ?	Yes.

Vicia artropurpurea :	Vetch	Purple
Origin	From California and France, grown in Palestine.	
Characteristics	Difficult to produce seed.	Average yield per dunam 2-3 tons.
Adaptation	Adapted to all Palestine. Winter and spring crop. With or without irrigation.	
Resistance	Resistant to rust.	
Use	Soilage, hay, pasture.	
Certified ?	Yes.	
Grades recognized ?	No.	
Authority for certification	Seed Committee. [A semi-official body consisting of representatives of the Dept. Agric., of the Jewish Agency, of the Field Crop Growers' Association, and of " Hazera " Seed Producers Co-operative.]	
On open market ?	No.	

Vicia sativa :	Common vetch	Negro wikke
Origin	Selection from endemic variety.	
Authority	Central Bureau, Farmer's Co-operation, Rotterdam, Holland.	
Characteristics	Rich foliage, late in flowering, good yield. Black coarse seed.	
Use	Hay, silage, soil conservation. Well suited for stubble.	
Certified ?	Yes.	
Grades recognized ?	No.	
Authority for certification	N.A.K. General Netherlands Inspection Service for Seeds of Field crops, Zoomweg 11, Wageningen.	
On open market ?	Yes.	

Vicia sativa :	Vetch	Förädlad Grävicker (Bred grey vetch)
Origin	Selection in Bretange-vetches.	
Authority	Swedish Seed Association, Svalöf, Sweden.	
Characteristics	Medium late, medium large seeds with gray veins. Vegetative growth rather vigorous.	
Adaptation	To southern and middle Sweden.	
Use	Mostly as green fodder but also for harvesting when ripe.	
Certified ?	Yes.	
Grades recognized ?	Original seed sold only by the General Swedish Seed Ltd. Also other seed on the market. For different qualities see page vii.	
Authority for certification	The State Central Seed Control Station.	
On open market ?	Yes, also for export.	

Vicia sativa :	Vetch	Förädlad Sötvicker (Bred sweet vetch)
Origin	Selection in commercial Swedish sweet vetches.	
Authority	Swedish Seed Association, Svalöf, Sweden.	

Characteristics	Medium early, large seeds with grey veins. Vegetative growth rather vigorous.
Adaptation	To southern and middle Sweden.
Use	As green fodder or hay in mixture with oats, or for harvest when ripe.
Certified ?	Yes.
Grades recognized ?	Original seed sold only by the General Swedish Seed Ltd. Also other seed in the market. For different qualities see page vii.
Authority for certification	The State Central Seed Control Station.
On open market ?	Yes, also for export.

Vigna catjang : **Cowpea** **E.B.4**
Origin Selected from a local white seeded variety.

Authority The Second Economic Botanist to the Government, C.P., and Berar, Nagpur, India.

Characteristics Stem twining 5-10 ft. long. Succulent, purple marks round about leaf axils. Branching profuse. Leaf pinnately trifoliate, stipulate. Leaflets rhomboid, ovate, 3-4 inches long, entire margin, acute apex. Flowers mostly alternate in pairs, on ends of long peduncles. Standard about an inch long, light purple, sometimes with white patches. Pod 5-10 in. long, spreading out or pendant. More or less cylindrical, dark green turning to straw colour on maturity. Seed white, about 0.25 in. long, almost oblong. One and half times as long as broad. Annual herb, sown in June or July after break of rains and ready for harvest for fodder by the months of October or November. Single cut is obtained.

Adaptation Adapted to light or medium soils with precipitation of 20 in. to 50 in. of rain and latitude 15°—24° in sub-tropical climate.

Use Green fodder (soilage).

Certified ? No.

Grades recognized ? No.

Vigna sinensis :**Cowpea****Fo. S. 1**

Authority	Fodder Specialist, Government of Punjab, India.
Characteristics	Annual summer legume with stems creeping on the ground like a vine. Leaves are trifoliate and dark green. Flowers are violet coloured. Pods are 3 to 4 in. long, green, but turn to pale yellow on ripening. The grain is rhomboidal, buff-coloured and thickly but evenly sprinkled with minute blue specks.
Adaptation	Is not exacting in soil requirements but grows best in lighter soils. It can grow throughout the Province successfully under irrigated conditions. It can be sown from March to the end of July.
Resistance	Sometimes severely attacked by jassid and red leaf spots which dry the leaves and reduce yield.
Use	Cut and fed green. Fairly nutritious but cannot be turned into hay as leaves drop on drying. Can be sown in mixture with maize and Sudan grass. Being rich in proteins does not make good silage.
Certified ?	Yes.
Grades recognized ?	No.
Authority for certification	Department of Agriculture, Punjab.

Vigna unguiculata :**Cowpea****Mundata****K397**

Origin	From Kenya, coast province.
Authority	Agricultural Sub-station, Karnal, Punjab, India.
Characteristics	Early procumbent leaves light green, flowers bluish purple, pods white, slightly curved. Seeds grey spotted, of medium size. Yield of grain = 820 lb. and forage = 20,500 lb. per acre.
Adaptation	Can be grown on any type of soil which is well drained, but heavy clay soils are unsuitable.
Resistance	Resistant to wilt (<i>Macrophomina</i> sp.).

Use Grown successfully mixed with *Sorghum* and *Zea mays* for fodder. Mixture exhausts the soil less than does single *Sorghum* crop. Cowpea has good effect on soil fertility, and is being studied as green manure.

Vigna unguiculata : Cowpea Kundi K499

Origin From Tanganyika.

Authority Agricultural Sub-Station, Karnal, Punjab, India.

Characteristics Late, procumbent, leaves light green, flowers bluish purple, pod pinkish brown, straight, seed fawn and small. Yield of grain 410 lb., of forage 20,500 lb. per acre.

Adaptation Can be grown on any type of soil which is well drained, but heavy clay soils are unsuitable.

Resistance Resistant to wilt (*Macrophomina* sp.). Susceptible to frosts.

Use Grown successfully mixed with *Sorghum* and *Zea mays* for fodder. Mixture exhausts the soil less than does single *Sorghum* crop. Cowpea has good effect on soil fertility, and is being studied as green manure.

Vigna unguiculata : Cowpea K585

Origin Mauritius.

Authority Agricultural Sub-station, Karnal, Punjab, India.

Characteristics Early, prostrate, leaves light green and colour retained till end of the season ; flowers light purple ; pods pinkish-brown, slightly curved ; seeds fawn. Yield of grain = 656 lb., of forage = 24,600 lb. per acre.

Adaptation Can be grown on any type of soil which is well drained, but heavy clay soils are unsuitable.

Resistance Resistant to wilt (*Macrophomina* sp.) and to leaf spot (*Cercospora* sp.).

Use Grown successfully mixed with *Sorghum* and *Zea mays* for fodder. Mixture exhausts the soil less than does single *Sorghum* crop. Cowpea has good effect on soil fertility, and is being studied as green manure.

Vigna unguiculata :	Cowpea	Chanli	K598
Origin	E. Kandesh.		
Authority	Agricultural Sub-station, Karnal, Punjab, India.		
Characteristics	Late, procumbent ; leaves purplish-green ; flowers bluish-purple ; pods brown with purplish splash and straight ; seed fawn and small. Yield of grain 234 lb., and forage 24,600 lb. per acre.		
Adaptation	Can be grown on any type of soil which is well drained, but heavy clay soils are unsuitable.		
Resistance	Resistant to wilt (<i>Macrophomina</i> sp.) and to leaf spot (<i>Cercospora</i> sp.).		
Use	Grown successfully mixed with <i>Sorghum</i> and <i>Zea mays</i> for fodder. Mixture exhausts the soil less than does single <i>Sorghum</i> crop. Cowpea has good effect on soil fertility, and is being studied as green manure.		
Vigna unguiculata :	Cowpea	Konathadavani	K700
Origin	Madras.		
Authority	Agricultural Sub-station, Karnal, Punjab, India.		
Characteristics	Early, erect, leaves dark green, colour retained to end of the season ; flowers deep purple, pods dark brown and curved, seeds brick-red and small. Yield of grain 574 lb., and of forage 16,400 lb. per acre.		
Adaptation	Can be grown on any type of soil which is well drained, but heavy clay soils are unsuitable.		
Resistance	Resistant to wilt (<i>Macrophomina</i> sp.) and leaf spot (<i>Cercospora</i> sp.).		
Use	Grown successfully mixed with <i>Sorghum</i> and <i>Zea mays</i> for fodder. Mixture exhausts the soil less than does single <i>Sorghum</i> crop. Cowpea has good effect on soil fertility, and is being studied as green manure.		
Vigna unguiculata :	Cowpea	Kimakoko	K782
Origin	From Kenya, coast-province.		
Authority	Agricultural Sub-station, Karnal, Punjab, India.		
Characteristics	Early, procumbent, leaves green colour retained till		

end of the season. Flowers deep purple, pods pinkish white, straight, seeds red and medium size. Approx. grain yield is 656 lb. and forage yield 20,500 lb. per acre.

Adaptation	Can be grown on any type of soil which is well drained, but heavy clay soils are unsuitable.
Resistance	Resistant to wilt (<i>Macrophomina</i> sp.) and to leaf spot (<i>Cercospora</i> sp.).
Use	Grown successfully mixed with <i>Sorghum</i> and <i>Zea mays</i> for fodder. Mixture exhausts the soil less than does single <i>Sorghum</i> crop. Cowpea had good effect on soil fertility, and is being studied as green manure.

***Zea hybrida* :**

Origin	Hybrid corn Canbred 150 A double cross hybrid involving inbreds 32, 50, 131, and 140. All developed at Ottawa. Inbreds 32 and 50 are flint lines while 131 and 140 are dent lines. The method of combining is (50 × 32) (131 × 140).
Authority	The Division of Forage Plants, Central Experimental Farm, Ottawa, Ontario, Canada.
Characteristics	Morphological characters vary to some extent. Average height 6 to 7 ft. Upper ear borne about 2 ft. above the ground. Tillers lightly (1—2). Ears vary somewhat from light to dark yellow to slightly reddish yellow, and rows vary from 12 to 16. Kernels are mostly of an intermediate flinty-dent type.
Adaptation	Belongs to the 'very early' maturity group. At Ottawa the period from seeding to full maturity requires approximately 110 to 115 days. Adapted to good, well drained soils, high in fertility.
Resistance	While not seriously affected by any disease at Ottawa, no special disease resistance is claimed. Stalks are fairly light and serious damage may result from a heavy infestation of European corn borer.
Use	For production of ear corn, or for silage.
Certified ?	Not at present.
Grades recognized ?	Only one grade of hybrid seed corn is recognized in Canada and that is registered.
On open market ?	Only small amounts of seed are at present being produced by the originator, the Division of Forage Plants, Central Experimental Farm, Ottawa, Ont.

Zea hybrida :	Hybrid corn	Canbred 250
Origin	A double cross hybrid involving inbreds 99, 103, 135 and 140, all dent lines. The method of combining the lines in the double-cross is (103×99) (135×140) .	
Authority	The Division of Forage Plants, Central Experimental Farm, Ottawa, Canada.	
Characteristics	Morphological characters show some variability. Height averages from 6.5-7.5 ft., with the upper ear borne about 2.5 ft. above the ground. Tillers mostly absent. Ears vary from yellow to reddish yellow and rows vary from 12 to 18. Kernels are of the dent type.	
Adaptation	Belongs to the 'very early' maturity group. At Ottawa the period from seeding to full maturity requires approximately 115 to 120 days. Adapted to good, well-drained soils, high in fertility.	
Resistance	While not seriously affected by any disease at Ottawa, no special disease resistance is claimed. Stalks are of medium size and serious damage may result from a heavy infestation of European corn borer.	
Use	Chiefly for the production of ear corn. May also be used for silage.	
Certified ?	Not at present.	
Grades recognized ?	Only one grade is recognized in Canada, and that is registered.	
Authority for certification	Canadian Seed Growers' Association, Ottawa,	
On open market ?	Only small amounts of seed are at present being produced by the originators, the Division of Forage Plants, Ottawa.	

Zea indurata :	Flint corn	Beacon
Origin	Selection made from a synthetic or multiple cross of about 20 inbred lines obtained from the variety, Howe's Alberta Flint. The inbreds were selfed for 5 to 7 years, and the multiple cross was made in 1930.	

Authority	Division of Forage Plants, Central Experimental Farm, Ottawa, Ontario, Canada.
Characteristics	Characteristics described are those observed at Ottawa: Plant type—height, 4 ft. 6 in. to 5 ft. 6 in. tillers, 2 to 4, primary ear carried at average height of 15 to 18 in. above ground. Ear type—flint, predominantly 8-rowed, few 10-12 rowed, length, 5 to 8 inches, slightly tapering towards tip. Kernel colour—yellow; cob colour—white; maturity—100 days from seeding to mature ears.
Adaptation	Is among the earliest of corn varieties, and has been matured in every province of Canada.
Resistance	Smut is the only disease which has been observed to affect Beacon, and this only to a minor degree, although no definite disease resistance is claimed. Heavy infestation by the European corn borer can cause serious damage because of the relative fineness of stalks.
Use	Essentially an early grain corn and under suitable conditions should yield from 30 to 40 bushels per acre.
Certified ?	Only available seed is a limited amount of Foundation Stock maintained by the Forage Plants, Central Experimental Farm, Ottawa, Ont. This is available for the production of registered seed.
Grades recognized ?	Yes, but none of the grades exist except Foundation Stock.
Authority for certification	Canadian Seed Growers' Association.
On open market ?	No seed is available except a limited amount of Foundation Stock.

Zea mays :	Maize	Atherton Main Type
Origin	A complex hybrid of very many varieties introduced into Queensland.	
Authority	[Information supplied by] W. W. Bryan and C. J. McKeon, Queensland, Australia.	
Characteristics	Great vegetative vigour. Grain starchy, deep, well packed, of very variable colour.	
Adaptation	To Atherton Tableland, especially rain forest soils.	
Resistance	Highly susceptible to <i>Diplodia zeae</i> .	
Use	Grain, also silage and green fodder.	
Certified ?	No.	
Grades recognized?	No.	
On open market ?	Commercially available.	

Zea mays :	Maize	Boone County White
Origin	Introduced from U.S.A. via N.S. Wales, to Queensland.	
Authority	Dept. Agric. and Stock, Queensland, Australia.	
Characteristics	Grain fairly deep. White.	
Adaptation	Cooler districts. Needs good moisture.	
Use	Excellent fodder and grain.	
Certified ?	No.	
Grades recognized?	No.	
On open market ?	Commercially available.	

Zea mays :	Maize	Durum
Origin	Cross between Improved Yellow Dent and a deep grained amber Flint, now grown in Queensland.	
Authority	C. J. McKeon, Queensland, Australia.	
Characteristics	Hard, bright amber grain, open shoulders, good husk cover.	
Adaptation	To Atherton Tableland, especially open forest soils and tropical coast.	

Resistance Has a degree of resistance to *Diplodia*.

Use Grain, also fodder.

Certified ? No.

Grades recognized? No.

On open market ? Commerically available.

Zea mays : **Maize** **Fitzroy (formerly Improved Yellow Dent)**

Origin Introduced, but has been reselected, for production in New South Wales, Australia.

Characteristics Fine succulent stems. Good husk covering. Bright amber grain. Late maturing type.

Adaptation For New South Wales conditions.

Use Green fodder and silage.

Certified ? No.

Grades recognized? No.

On open market ? Yes.

Zea mays : **Maize** **Fitzroy**

Origin Selection from Improved Yellow Dent made at Queensland Agric. College.

Authority W. W. Bryan, Queensland, Australia.

Characteristics Good vegetative vigour. Good husk cover. High yield. Ears slightly high. Late.

Adaptation As for Yellow Dent, and also more into sub-coastal areas.

Resistance Moderately drought susceptible.

Use Grain and fodder.

Certified ? No.

Grades recognized? No.

On open market ? Commercially available.

Zea mays :	Maize	Golden Beauty
Origin	Introduced into New South Wales.	
Authority	Dept. Agric. New South Wales, Australia.	
Characteristics	Long, narrow cobs, medium hard amber grain. Mid-season maturity.	
Adaptation	To New South Wales conditions.	
Use	Green fodder and silage.	
Certified ?	No.	
Grades recognized ?	No.	
On open market ?	Yes.	

Zea mays :	Maize	Golden Beauty
Origin	Introduced into Queensland,	
Authority	Dept. Agric. and Stock, Queensland, Australia.	
Characteristics	Moderately late, very good husk cover. Long ears with 12 rows of broad grain.	
Adaptation	To sub-coastal and coastal south-east Queensland.	
Resistance	Moderate drought resistance.	
Use	Grain, also fodder.	
Certified ?	No.	
Grades recognized ?	No.	
On open market ?	Commercially available.	

Zea mays :	Maize	Golden Nugget
Authority	Dept. Agric., New South Wales, Australia.	
Characteristics	Hard yellow grain. Well covered husks. Midseason maturity. Late sowings.	
Adaptation	To New South Wales conditions.	
Resistance	Resistant to leaf blight.	
Use	Green fodder and silage.	

Certified ? No.

Grades
recognized ? No.

On open market ? Yes.

Zea mays :	Maize	Hickory King
Origin	Introduced.	
Authority	Dept. Agric., New South Wales, Australia.	
Characteristics	Large white grain, suckers freely. .	Poor husks. Mid-season maturity.
Adaptation	To second-class soils only.	
Use	Green fodder and silage.	
Certified ?	No.	
Grades recognized ?	No.	
On open market ?	Yes.	

Zea mays :	Maize	Unnamed hybrids (many double crosses)
Origin	Bred at Queensland Agric. College, Australia.	
Authority	W. W. Bryan, Queensland, Australia.	
Characteristics	A wide range of high yielding non-lodging types ready for release.	
Adaptation	To conditions in south-east Queensland.	
Resistance	Several show improved drought resistance.	
Use	Grain and fodder.	
Certified ?	Is to be.	
Grades recognized ?	No.	
Authority for certification	Dept. Agric. and Stock, Queensland.	
On open market ?	At present only available in small experimental quantities.	

Zea mays :	Maize	Improved Yellow Dent
Origin	Selection from N.S. Wales Improved Yellow Dent.	
Authority	Dept. Agric. and Stock, Queensland, Australia.	
Characteristics	Good vegetative development. High yield. Late. Good husk cover.	
Adaptation	South-east coast of Queensland and rain forest areas. Does best with good rainfall.	
Use	Grain, and fodder.	
Certified ?	No.	
Grades recognized ?	No.	
On open market ?	Commercially.	

Zea mays :	Maize	Iowa Silvermine
Origin	Introduced.	
Authority	Dept. Agric., New South Wales, Australia.	
Characteristics	White variety. Early maturing.	
Adaptation	To conditions in New South Wales.	
Resistance	Drought resistant.	
Use	Grain, green fodder.	
Certified ?	No.	
Grades recognized ?	No.	
On open market ?	Yes.	

Zea mays :	Maize	Leaming
Origin	Introduced.	
Authority	Dept. Agric., New South Wales, Australia.	

Characteristics	Dark amber grain. Midseason maturity. Early sowing.
Adaptation	To conditions in New South Wales.
Use	Green fodder and silage.
Certified ?	No.
Grades recognized ?	No.
On open market ?	Yes.

Zea mays :	Maize	Leaming
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Origin	Selection from N. S. Wales, Leaming.
Authority	W. W. Bryan, Queensland, Australia.
Characteristics	Tendency to sucker. High yield. Narrow closely packed grain of high quality.
Adaptation	To conditions in south-east Queensland.
Use	Grain, and fodder.
Certified ?	No.
Grades recognized ?	No.
On open market ?	Commercially available.

Zea mays :	Maize	Pride of Hawkesbury
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Authority	Dept. Agric., New South Wales, Australia.
Characteristics	Thick stalk and large cob. Rather poor husks, dull yellow soft grain. Late maturing. Requires good soils.
Adaptation	To conditions in New South Wales.
Use	Green fodder and silage.
Certified ?	No.
Grades recognized ?	No.
On open market ?	Yes.

Zea mays :	Maize	Reid's Yellow Dent
Origin	Introduced from U.S.A.	
Authority	Dept. Agric. and Stock, Queensland, Australia.	
Characteristics	Pale amber, rough starchy grain. High yield. Moderately early. Very heavy yielder in coastal areas.	
Adaptation	To conditions in sub-coastal south-east Queensland.	
Resistance	Susceptible to ear rot and weevil.	
Use	Grain, and fodder.	
Certified ?	No.	
Grades recognized ?	No.	
On open market ?	Commercially available.	

Zea mays :	Maize	Silvermine
Origin	Introduced from U.S.A. via N. S. Wales.	
Authority	Dept. Agric. and Stock, Queensland, Australia.	
Characteristics	Deep grain with rough dent. White.	
Adaptation	To conditions in south-east Queensland. Coast and S. Burnett areas.	
Use	Fodder and grain.	
Certified ?	No.	
Grades recognized ?	No.	
On open market ?	Commercially.	

Zea mays :	Maize	Star Leaming
Origin	Introduced from U.S.A.	
Authority	Dept. Agric. and Stock, Queensland, Australia.	
Characteristics	Low ears. Moderately early. Attractive grain.	
Adaptation	Sub-coastal area in south-east Queensland.	
Resistance	Best of standard varieties for drought resistance.	
Use	Grain, and fodder.	
Certified ?	No.	
Grades recognized ?	No.	
On open market ?	Commercially available.	

Zea mays :**Origin****Hybrid corn****Algonquin**

The immediate product of a cross between the two open-pollinated varieties—Quebec 28 and Silver King (Wisconsin No. 7). The former is an early maturing 12-rowed yellow flint, while the latter is a late maturing white dent. Fresh seed must be produced each year by the well-established practice of inter planting and detasselling of the female parent.

Authority

Agronomy Department, Macdonald College, Quebec, Canada.

Characteristics

In stature it is approximately intermediate between the two parents, averaging 8-10 ft. The suckering habit is also intermediate. Maturity is about 2 weeks later than the early parent. The ear is distinctly hybrid in character showing segregation of yellow and white in the kernel colour. The ears are in general conformation more similar to the flint but show some of the dent shape. Kernels for the most part are flint-like but develop more or less mild denting.

Adaptation

For areas having a frost free silage season of 90-100 days, or for grain in districts where frost is not prevalent over 130 days. Requires typical corn soil, warm and well drained.

Resistance

No particular resistance evident.

Use

Chief agronomic use is as a silage corn in those sections of Quebec (or similar sections elsewhere in Canada) having the least favourable corn climate, i.e. the higher, cooler parts. It may be used, however, as the grain corn in those sections where the longer frost-free seasons are found.

Certified ?

Officially certified seeds are produced under the direction of the Provincial Seed Farm attached to Macdonald College. In addition to the fairly large production on the farm itself, the equipment (dryer and grader) forms the basis for a seed centre involving farmers of the vicinity.

Grades recognized ? Only one grade of seed—registered—is officially recognized.

Authority for certification

The Canadian Seed Growers' Association and the Plant Products Division inspectors examine the crop in the field and finally seal the seed in the ultimate package.

On open market ?

Yes. Up to the present there has scarcely been enough to supply the local needs. The average yearly production is about 500-600 bushels (56 lb. per bushel).

Zea mays :	Hybrid corn	Harvic 222
Origin	A double cross hybrid involving the use of four yellow dent inbreds. The pedigrees of the single crosses are coded under the numbers 2001 and 2002.	
Authority	The Dominion Experimental Station, Harrow, Ontario, Canada.	
Characteristics	Average plant height 7 to 8.5 ft. Upper ear borne about 2.5-3 ft. above the ground. Tillers almost absent. Kernels are dent type and are yellow in colour. 14 to 18 rows of kernels per ear.	
Adaptation	Belongs to the early maturity groups. At Harrow it is classified among 100 to 105-days hybrids. Adapted to well drained soils of good fertility.	
Resistance	Not seriously affected by any disease but no special disease resistance is claimed.	
Use	For grain production. Adapted for ensilage in Central and Eastern Ontario.	
Certified ?	Yes, in 1945.	
Grades recognized ?	Only one grade of hybrid seed corn is recognized in Canada and that is registered.	
Authority for certification	Canadian Seed Growers' Association, Ottawa, Canada.	
On open market ?	No seed available on the open market in 1945. However, there should be enough seed to meet the demand after this date.	

Zea mays :	Hybrid corn	Harvic 300
Origin	A double cross hybrid involving the use of four yellow dent inbreds. The pedigrees of the single crosses are coded under the numbers 2003 and 2004.	
Authority	The Dominion Experimental Station, Harrow, Ontario, Canada.	
Characteristics	Average plant height 7.5-9 ft. Upper ear borne about 3 ft. above the ground. Tillers almost absent. Kernels are dent type and yellow in colour. 14 to 18 rows of kernels per ear.	
Adaptation	Belongs to the medium maturity group. At Harrow it is classified among 10-day hybrids. Adapted to well-drained soils of good fertility.	

Zea mays :	Corn	Manalta
Origin	The result of crossing Howes Alberta Flint by Manitoba Flint. Selection continued for early maturity.	
Authority	Manitoba Agricultural College, Winnipeg, Canada.	
Characteristics	A short growing very early maturing flint corn. Ears 8 rowed and yellow in colour. About a week earlier in maturing than Manitoba Flint. Shorter in growth habit than Manitoba Flint and carries ears somewhat closer to ground.	
Adaptation	For areas requiring earlier maturity than that represented by Manitoba Flint, Gehu, Dakota White Flint and varieties of similar earliness.	
Use	Extreme early maturity is outstanding. Adapted for hogging off purposes to short growing season areas. Ears too close to ground to permit handling with ordinary harvesting machinery. A somewhat lower yielder than Manitoba Flint.	
Certified ?	No.	
On open market ?	No.	

Zea mays :	Corn	Manitoba Flint
Origin	Foundation material comprised the varieties Quebec No. 28, Gehu and Free Press. These were allowed to intercross freely and continued selection made from progeny.	
Authority	Manitoba Agricultural College, Winnipeg, Canada.	
Characteristics	A relatively short growing profusely tillering flint corn carrying ears rather close to the ground. Growth habit similar to that of such well-known varieties as Gehu and Dakota White Flint. Height 3.5-5ft. Kernel colour yellow, cob colour white. Number of rows of kernel 8 to 12, with 12 predominating.	
Adaptation	Adapted to short season areas such as those of southern Manitoba having an average frost free season of 109 to 120 days and an average growing season temperature of 59 to 62°.	
Use	Outstanding feature is early maturity. Well adapted for hogging off purposes. A good yielder; not adapted for handling with ordinary harvesting machinery on account of low growing ears.	
On open market ?	No.	

Zea mays indurata :	Flint corn	Quebec No. 28
Origin	A result of ear-to-row selection of the variety Quebec Yellow, secured from a private grower—Mr. B. T. Reid of Ulverton, P.Q. Since 1918 it has been maintained by straight mass selection.	
Authority	Agronomy Department, Macdonald College, Quebec, Canada.	
Characteristics	Since this is a highly cross-fertilized species its morphological and other characteristics cannot be precisely stated. The ear is, in general, 12 rowed, but shows variation in the production of 8-10 and 14 rowed ears in small proportion. The kernels are yellow, shallow and almost oval in shape. Plant stature is small varying from 6 to 8 feet. Suckers freely—particularly on rich ground and where planted thinly. It is a relatively early maturing variety—in the Macdonald College latitude it requires 120 days on the average to become completely mature.	
Adaptation	Among the earliest Canadian varieties of corn. Like all corn it requires a warm well-drained soil. Fertility level more important than soil type if drainage assured.	
Resistance	It is believed to possess some degree of cold resistance (no positive confirmation). No definite resistance of any kind is claimed for this variety. It develops about average resistance to smut and, due to its character of growth, is rather badly affected by a heavy infestation of the corn borer.	
Use	Chief agronomic use is as a producer of ripe grain where it gives an average yield of from 40-50 bushels. For some years it has been used as the female parent of a varietal hybrid (see Algonquin).	
Certified ?	Officially certified seeds are produced only at Macdonald College where it originated. There is, however, a limited production throughout the western part of the province.	
Grades recognized?	Different grades of seed do not exist.	
Authority for certification	The variety has been accepted for registration by the Canadian Seed Growers' Association. Owing to the limited circulation the formalities of inspection are not carried out but Macdonald College is regarded as the foundation stock of seed of this sort.	
On open market ?	Certified seed is only available through Macdonald College in limited quantities.	

Zea mays**Saskatchewan White Flint**

Origin	Mixed Flint.
Authority	Division of Forage Crops, Dominion Experimental Station, Swift Current, Saskatchewan, Canada.
Characteristics	A low growing variety, the stems reaching an average height of 2 and 1.5-3 ft. The plants produce a number of tillers and are quite leafy. Ears numerous but rather small, being mostly from 5 to 7 in. long and having 8 rows of kernels. A few of the ears are 10 or 12-rowed. The kernels are all white, hard and of medium size.
Adaptation	Adapted to many kinds of soil but does best to medium or sandy loams. Usually good yields are obtained with an annual precipitation of from 13 to 17 in. An early variety and practically all the ears mature every year in the vicinity of Swift Current. It matures as far or farther north as Saskatoon, Saskatchewan.
Use	Outyields all others in shelled corn per acre at Swift Current. It is used largely as feed grain and for hogging off.
Certified ?	Yes.
Grades recognized ?	Yes, registered and certified seed, grades 1, 2 and 3, on basis of viability, uniformity, colour, etc.
Authority for certification	Canadian Seed Growers Association and Dominion Department of Agriculture.

Zea mays :**Maize****Local unnamed**

Origin	Palestine.
Authority	Dept. Agric., Palestine.
Characteristics	Average yield 4-6 tons per dunam.
Adaptation	Adapted to all Palestine. Growth throughout summer. With and without irrigation.
Resistance	No pests or diseases recorded.

Use Soilage, silage, pasture.

Certified ? No.

Grades
 recognized ? No.

On open market ? Yes.

Zea mays :

Teomaize

Origin Developed from cross between maize and *Euchlaena mexicana*.

Authority [Information supplied by] Dr. A. R. Saunders, South Africa.

Characteristics Stools prolifically and distinguished from other stooling varieties by the fact that the length of the tillers or suckers is usually the same as that of the main stem. Matures early, grain yellow.

Resistance Drought resistant.

Use For ensilage.

On open market ? Yes.

PART 2

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(Compiled by Mrs. I. TROKE)

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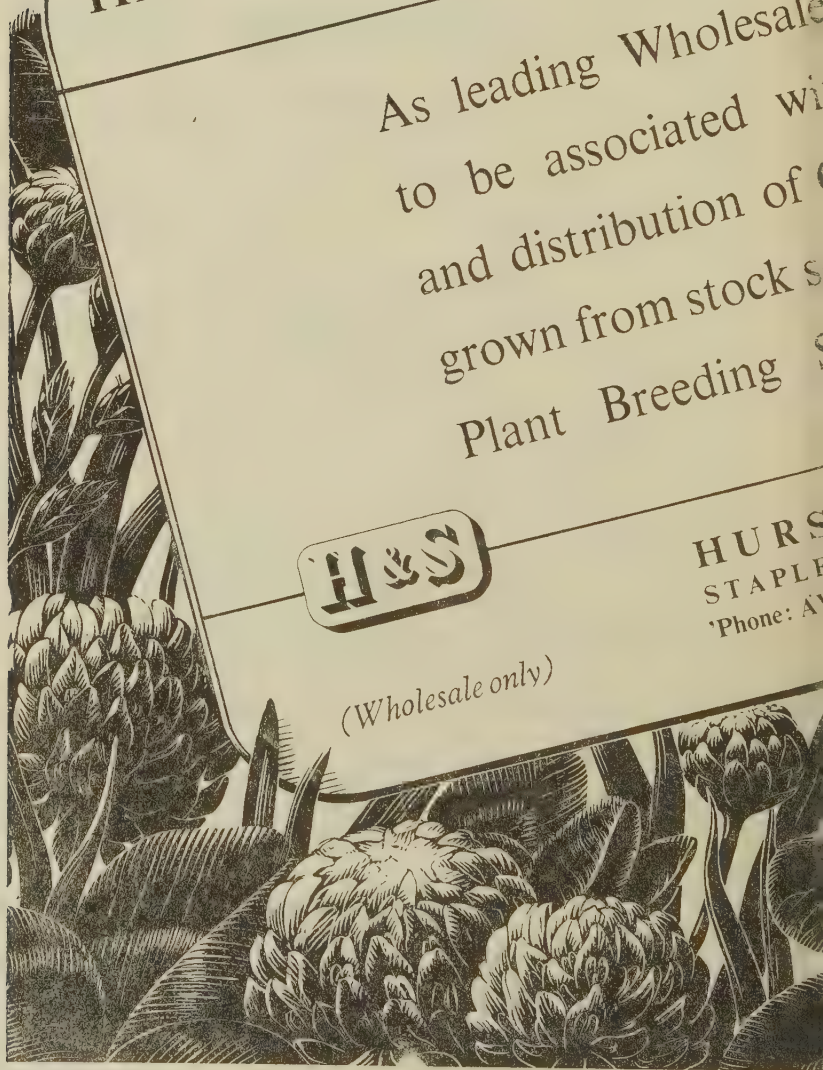
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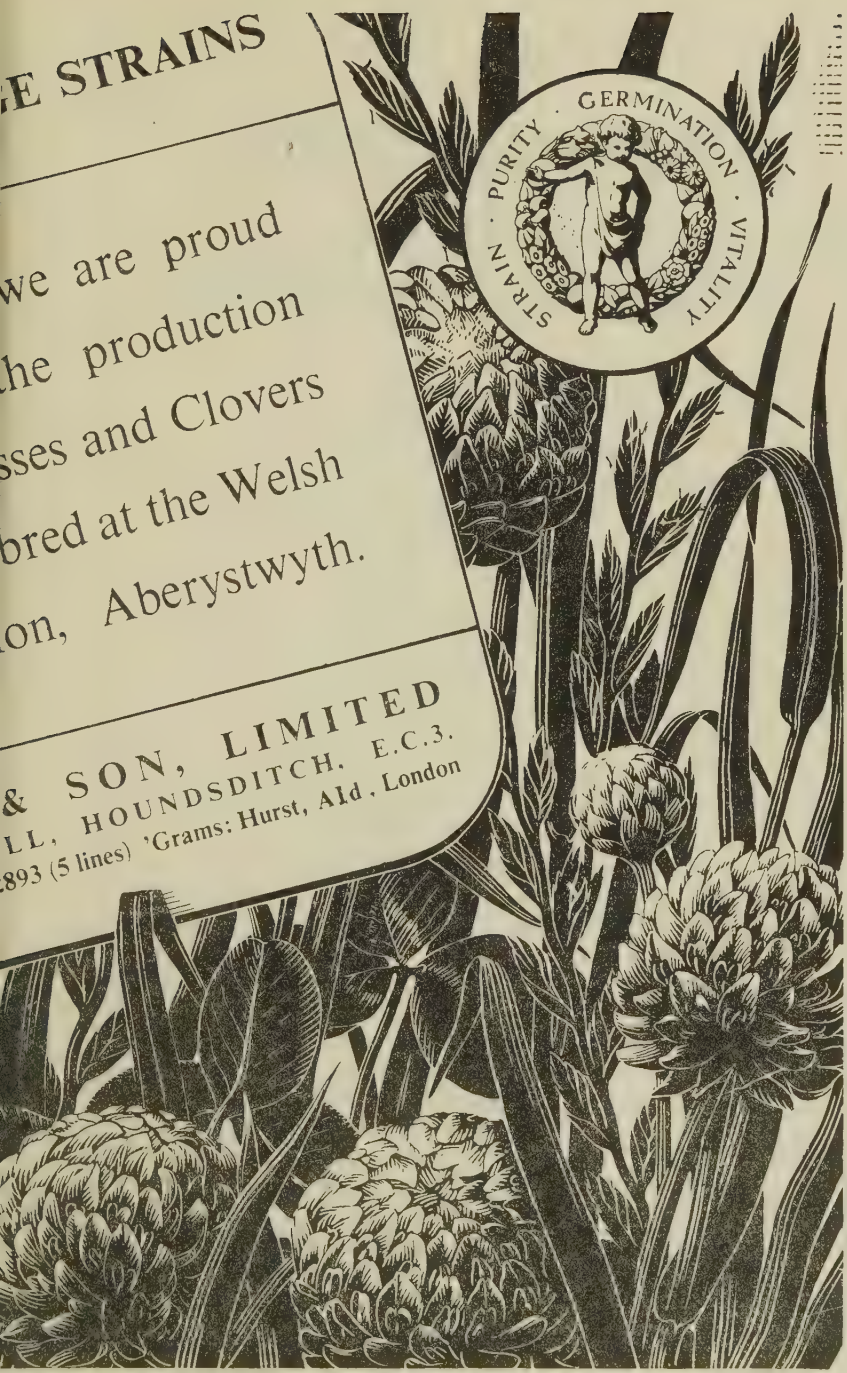
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